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FLOOD INSURANCE STUDY

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ORIGINAL

LEE COUNTY, VIRGINIA
UNINCORPORATED AREAS

MARCH 4, 1987

Federal Emergency Management Agency

COMMUNITY NUMBER - 510085

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NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

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EXHIBITS - continued

Exhibit 2 - Flood Insurance Rate Map Index and Street Index
Flood Insurance Rate Map

Exhibit 3 - Elevation Reference Marks

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FLOOD INSURANCE STUDY
LEE COUNTY, VIRGINIA

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in Lee County, Virginia, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in their efforts to promote sound flood plain management. Minimum flood plain management requirements for participation in the National Flood Insurance Program are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, flood plain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were prepared by the Tennessee Valley Authority for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement No. EMW-E-1156, Project Order 1. This work was completed in March 1985.

1.3 Coordination

In April 1983, streams requiring detailed study were identified at an initial Consultation and Coordination Officer's (CCO) meeting attended by representatives of FEMA, Lee County, and the Tennessee Valley Authority (TVA). On February 24, 1986, the results of the study were reviewed at a final CCO meeting held with representatives of FEMA, the county, and the TVA.

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2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the unincorporated areas of Lee County, Virginia. The Towns of Jonesville, Pennington Gap, and St. Charles are not included in this study. The area of study is shown on the Vicinity Map (Figure 1).

The following streams were studied by detailed methods: Straight Creek from its confluence with the North Fork Powell River to approximately 0.6 mile upstream of State Route 636; Gin Creek from its confluence with Straight Creek to approximately 0.92 mile upstream of State Route 635; Big Branch from its confluence with Straight Creek to approximately 0.42 mile upstream of State Route 628; Baileys Trace from its confluence with Straight Creek to approximately 0.3 mile upstream of State Route 717; Wallen Creek from approximately 1.58 miles downstream of the confluence of Dry Creek to approximately 0.29 mile upstream of U. S. Route 58-421; Dry Creek from its confluence with Wallen Creek to approximately 0.25 mile upstream of State Route 738; the North Fork Clinch River from the downstream county boundary to the Southern Railway; Mud Creek from State Route 708 to approximately 0.3 mile upstream of State Route 622; the Powell River from approximately 0.87 mile downstream of U. S. Route 421 to approximately 0.97 mile upstream and from State Route 619 to approximately 1.1 miles upstream of U. S. Route 58A; Poor Valley Branch from its confluence with Martin Creek to approximately 0.47 mile upstream of U. S. Route 58; Indian Creek from approximately 0.16 mile downstream of U. S. Route 58 to approximately 0.62 mile upstream of State Route 724; Martin Creek from approximately 0.4 mile downstream of U. S. Route 58 to a point approximately 0.14 mile upstream; Cane Creek from the downstream county boundary to approximately 0.06 mile upstream of U. S. Route 58A; the North Fork Powell River from its confluence with the Powell River to the confluence of Straight Creek; Fawn Branch from its confluence with Baileys Trace to approximately 0.57 mile upstream of State Route 637; Dry Branch from its confluence with the North Fork Powell River to approximately 0.91 mile upstream of U. S. Route 58A; and Poor Valley Creek from its confluence with the North Fork Powell River to approximately 1.51 miles upstream of State Route 621 at river mile 2.02. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction through March 1990.

All or portions of the following streams were studied by approximate methods: Bear Branch; Blackwater Creek; Bundy Creek; Bobs Branch; Cox Creek; Clark Branch; Craborchard Creek; Clear Spring Branch; Camp Creek; Cane Creek; Cox Branch; Chances Branch; Dry Branch; Dry Creek; East Fork Blackwater Creek; Flanary Branch; Fourmile Creek; Gravelly Branch; Hardy

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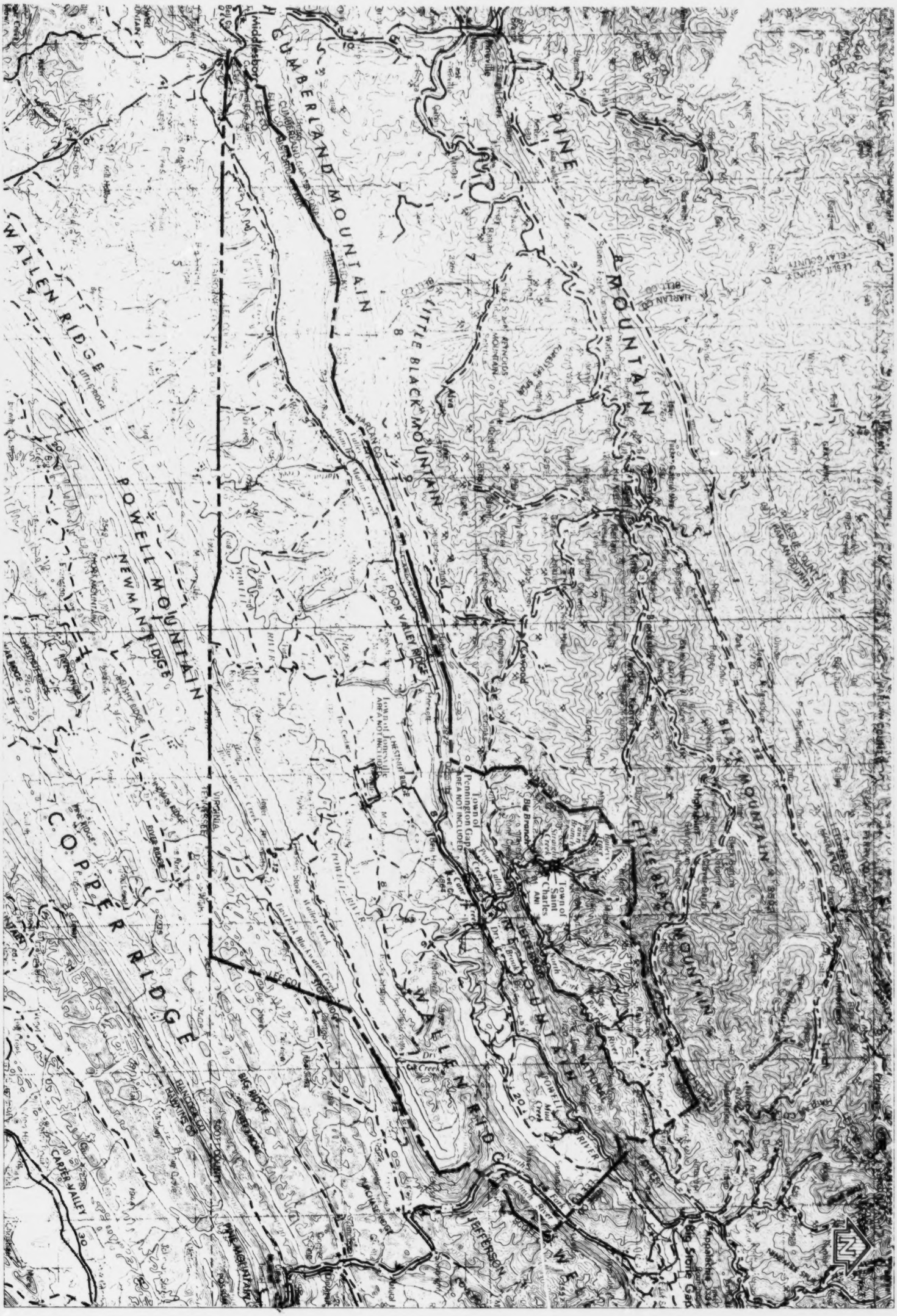

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

APPROXIMATE SCALE

4 0 4 8 12 MILES

VICINITY MAP

FIGURE 1

3

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Creek; Hamblin Branch; Indian Creek; Jordan Branch; Lovelady Creek; Lick Branch; Little Yellow Branch; Little Creek; Low Gap Branch; Mud Creek; McConnell Branch; Moore Branch; Meadow Branch; Martin Creek; Meek Branch; Mud Creek; the North Fork Powell River; the North Fork Clinch River; Northeast Fork Blackwater Creek; the Powell River; Payne Branch; Poor Valley Branch; Rocklick Branch; Roaring Branch; Robertson Branch; Robinette Branch; Sims Creek; Station Creek; Sugar Run; Station Creek; Speaks Branch; Town Branch; Trading Creek; Wells Branch; Wallen Creek; Williams Branch; and Yellow Creek. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon by, FEMA and Lee County.

2.2 Community Description

Lee County is located in the extreme southwestern corner of Virginia. It is bordered by Scott County, Virginia, to the east, Wise County, Virginia, to the northeast, Bell and Harlan Counties, Kentucky, to the north, and Claiborne and Hancock Counties, Tennessee, to the south. According to the U. S. Bureau of the Census, the population of Lee County increased from 20,325 in 1970 to 25,956 in 1980 (Reference 1).

Lee County is predominately agricultural and has been since its settlement. The incorporated communities within the county are small with the largest, Pennington Gap, having a population of less than 2,000. The Appalachian coal region extends into the county in the vicinity of St. Charles. The coal industry has diminished in importance over the years, but its abandoned surface mines still affect the hydrology of the area.

The monthly average temperature ranges from 73.2 degrees Fahrenheit (°F) in summer to 33.7°F in winter. The average annual precipitation in the region is 51.8 inches (Reference 2). Most of the county drains into the Powell River via its many tributaries.

2.3 Principal Flood Problems

Information concerning past flooding on the Powell River within the study area is limited to floodmarks collected by the TVA following the major flood of March 12, 1963. Within Lee County, however, records from 1932 to the present at the U. S. Geological Survey (USGS) gage (No. 03531500) near Jonesville are available and are indicative of past flooding on the Powell River (References 3 and 4).

The largest known flood on the Powell River since at least 1918 occurred on April 5, 1977 (Reference 5). The flood reached an elevation of

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1,303.4 feet at the Jonesville gage, with a discharge of 57,000 cubic feet per second (cfs) and an estimated recurrence interval of approximately 200 years.

The second largest known flood at the Jonesville gage occurred in January 1918. According to local residents, this flood exceeded the January 1946 flood by approximately [illegible] feet in the middle and upper portions of the Powell River. At the gage, the discharge was estimated to be 41,000 cfs, with a recurrence interval of 50 years.

Other large floods occurred on March 12, 1963, January 8, 1946, and December 31, 1969. Within the study area, the March 1963 flood reached an elevation of 1,340.5 feet just downstream of the U. S. Route 421 bridge. At the Jonesville gage, the March 1963 flood reached an elevation of 1,292.4 feet, with a discharge of 31,100 cfs; the January 1946 flood reached an elevation of 1,289.9 feet, with a discharge of 30,000 cfs; and the December 1969 flood reached an elevation of 1,291.2 feet, with a discharge of 28,400 cfs. The recurrence intervals of these floods were approximately 15 to 20 years.

Flood information for the North Fork Powell River was available from local residents, newspaper articles, and a previous TVA report (Reference 3). Also, records (from 1945 to the present) from the USGS gage at the Old State Route 62 bridge were available.

The largest flood on the North Fork Powell River since at least 1918 occurred on April 4, 1977. It reached an elevation of 1,379.2 feet at the USGS gage. The discharge and recurrence interval at the gage were estimated to be 17,000 cfs and 120 years, respectively. In Pennington Gap, numerous businesses and residences were heavily damaged by floodwaters (Reference 5). Three of the town's supermarkets lost practically all of their stock. Approximately 20 homes were damaged or destroyed. The Pennington Gap water filtration plant was under water and put out of operation.

Local residents, newspaper articles, and reports indicated that another large flood occurred on the North Fork Powell River on January 28, 1918, and crested at an elevation of 1,377 feet at the site of the gaging station at Pennington Gap (Reference 6). The recurrence interval was estimated to be 60 years. No damage information was available. The floods of January 1946, March 1963, and December 1969 were approximately 2.4 to 4 feet lower than the 1977 flood at the gage.

Flood information for Cane Creek was also available from local residents, newspaper articles, and a previous TVA report (Reference 3). Also, floodmarks were obtained by the TVA following the major flood of April 4, 1977, and the minor floods of May 7, 1971, and October 24, 1971.

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The April 1977 flood reached an elevation of 1,386 feet just downstream of the U. S. Route 58A bridge. The recurrence interval for this flood was estimated to be 100 years. No damage information was available.

The May 7 and October 24, 1971, floods reached elevations of 1,383.8 and 1,381 feet, respectively. The recurrence interval for these floods was estimated to be less than 10 years.

On Dry Branch, flood information was limited to a series of floodmarks collected by the TVA following the minor flood of April 28, 1970. One of these marks, just downstream of the State Route 58A bridge, is at an elevation of 1,350 feet. The recurrence interval was approximately five years.

Information concerning past flooding on Straight Creek and Baileys Trace was available from newspaper accounts and field surveys. It is known that floods have occurred in the watershed since the early 1900s, but the floods were not well documented, and very little descriptive information was available for the period from 1900 to 1949. Four recording gages were installed in the watershed in December 1979 and January 1980, but no significant floods have occurred since that time. Floods for which either high-water marks or damage information were available occurred in 1949, 1957, 1963, 1969, and 1977. The 1963, 1969, and 1977 floods produced large accumulations of sediment in the stream channels. The stream channels were cleaned out following these floods to remove this sediment as well as fallen trees and other obstructions. The channel cleanout following the November 1977 flood was the most comprehensive, and the resulting channel provided significantly more flow capacity than it did previously. Consequently, the floods are not directly comparable because of changing channel conditions, and no recurrence intervals were provided.

Information about the July 16, 1949, flood on Straight Creek was limited to damage information. Below the confluence of Baileys Trace and Straight Creek, 10 businesses were flooded, and total damage (1949 dollars) was estimated at $11,000 (Reference 7).

The January 30, 1957, flood reached an elevation of 1,521.8 feet in the business district of St. Charles. Although no damage estimate was available, St. Charles High School and a number of businesses were flooded.

In 1963, a sequence of three floods occurred on March 6, March 11-12, and March 17. No high-water marks or damage information were available for the March 6 and March 11-12 floods; however, Straight Creek was out of

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its banks on both occasions. The March 17 flood crested at an elevation of 1,527.2 feet, flooding 26 homes and businesses (Reference 8). No damage estimate was available.

The flood of December 29-31, 1969, averaged approximately 2 feet above the January 1957 flood and was almost equal to the March 17, 1963, flood. According to a TVA field report, little actual flooding occurred (Reference 9).

A sequence of three floods occurred again on April 4, October 2, and November 5-6, 1977. The April 4 flood reached an elevation of 1,529 feet, the highest observed elevation since 1949. Businesses and homes were flooded, but no damage estimate was available. The October 2 flood reached an elevation of 1,527.6 feet. Although lower than the April flood, residents believe the October flood was worse (Reference 9). Streets were flooded, and waterlines, businesses, and St. Charles High School were damaged. No damage estimate was available. The November flood inundated downtown St. Charles.

Past flood information for Baileys Trace was limited to floodmarks collected by the TVA following the floods of March 17, 1963, and October 2, 1977. The 1963 and 1977 floods reached elevations of 1,532.5 and 1,532.7 feet, respectively. No damage estimates were available. No information concerning past flooding on the remaining streams studied by detailed methods was available.

2.4 Flood Protection Measures

Channel sedimentation has occurred near St. Charles as a result of flood flows. The sedimentation reduces the channel capacity of streams and occurs particularly at bridges and at the points of confluence of tributaries to Straight Creek. In order to reduce channel sedimentation, reclamation of abandoned mined lands in the vicinity of St. Charles began in 1979, and sediment trap structures were installed on four streams in 1980. The sediment trap structures are flow-through dams designed to trap coarse sediment near its source.

Non-structural measures of flood protection are also being used to aid in the prevention of future flood damage. These are in the form of land-use regulations, which control building within areas that have a high risk of flooding (Reference 10).

Several dams are located within Lee County; however, they are not used for flood control.

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3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equaled or exceeded once or the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for flood plain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied in detail affecting the community.

The stream gages located on Straight Creek, Gin Creek, and Baileys Trace have insufficient records for analysis. Consequently, regional relationships were developed to define peak discharge frequencies on these and the remaining ungaged study streams.

One set of regional relationships was developed for study streams within the Cumberland Plateau physiographic province, while another was developed for streams within the Valley and Ridge province. The adopted relationships were determined from gage records on watersheds with hydrometeorologic characteristics similar to the study streams. The stations used for the Cumberland Plateau and Valley and Ridge relationships are listed in Table 1.

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TABLE 1 - GAGING STATIONS

Stream	Gage No.	Drainage Area (sq. miles)	Period of Record
Used for Cumberland Plateau Relationships			
Bear Branch, Near Noble, Kentucky	03276000	2.21	1955-1982
Prater Creek, At Vansant, Virginia	03207400	19.8	1951-1977
Yellow Creek, Bypass near Middlesboro, Kentucky	03401500	35.3	1941-1982
South Fork Powell River, At Big Stone Gap, Virginia	03530000	40.0	1945-1947 1951-1977
Leatherwood Creek, At Daisy, Kentucky	03277400	40.9	1965-1982
Stony Creek, At Ft. Blackmore, Virginia	03525000	41.4	1950-1977
Martins Fork, Near Smith, Kentucky	03400800	55.8	1968-1977
Johns Creek, Near Meta, Kentucky	03210000	56.3	1939-1982
Yellow Creek, Near Middlesboro, Kentucky	03402000	60.6	1941-1982
Carr Fork, Near Sassafras, Kentucky	03277450	60.6	1964-1975
Cutshin Creek, At Wooton, Kentucky	03280700	61.3	1958-1982
North Fork Kentucky River At Whitesburg, Kentucky	03277300	66.4	1957-1982
Cranes Nest River, Near Clintwood, Virginia	03208950	66.5	1964-1982
North Fork Powell River, At Pennington Gap, Virginia	03530500	71.4	1945-1982
Poor Fork, At Cumberland, Kentucky	03400500	82.3	1940-1982
Clover Fork, At Evarts, Kentucky	03400700	82.4	1960-1982
Guest River, Near Coeburn, Virginia	03524500	87.3	1950-1982

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TABLE 1 - GAGING STATIONS - continued

Stream	Gage No.	Drainage Area (sq. miles)	Period of Record
Powell River, At Big Stone Gap, Virginia	03529500	112.0	1945-1982
Licking River, Near Salyersville, Kentucky	03248500	140.0	1939-1982
Red Bird River, Near Big Creek, Kentucky	03281040	155.0	1972-1982
Goose Creek, At Manchester, Kentucky	03281100	163.0	1965-1982
Troublesome Creek, At Noble, Kentucky	03278500	177.0	1950-1981
Used for Valley and Ridge Relationships			
Big Creek Tributary, Near Rogersville, Tennessee	03491300	2.00	1955-1977
Cedar Creek, Near Meadowview, Virginia	03475600	3.38	1967-1978
Big Sycamore Creek, Near Sneedville, Tennessee	03528100	5.51	1935-1945
Dickey Creek, At Sugar Grove, Virginia	03471100	7.28	1967-1977
Middle Fork Holston River, At Groseclose, Virginia	03473500	7.39	1948-1978
Sprouts Creek, Near Chatham Hill, Virginia	03487900	7.64	1967-1977
Staley Creek, Near Marion, Virginia	03473800	8.33	1951-1977
Beaver Creek, Near Wallace, Virginia	03475500	13.70	1946-1965
Cove Creek, Near Shelleys, Virginia	03489800	17.30	1951-1977
Lick Creek, Near Chatham Hill, Virginia	03487800	25.50	1966-1977
Reedy Creek, At Orebank, Tennessee	03487550	33.70	1964-1976

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TABLE 1 - GAGING STATIONS - continued

Stream	Gage No.	Drainage Area (sq. miles)	Period of Record
Bluestone River, At Bluefield, Virginia	03177700	39.80	1966-1977
Stony Creek, At Fort Blackmore, Virginia	03525000	41.40	1950-1977
Big Moccassin Creek, At Collinwood, Virginia	03489870	41.90	1967-1978
Beech Creek, Near Kepler Tennessee	03491300	47.00	1966-1978
Big Creek, Near Rogersville, Tennessee	03491000	47.30	1942-1977
Cedar Creek, Near Lebanon, Virginia	03523000	51.50	1953-1975
Beaverdam Creek, At Damascus, Virginia	03472500	56.00	1948-1978
South Fork Holston River, At Riverside near Chilhowie, Virginia	03471500	76.10	1921-1931 1942-1978
Big Moccasin Creek, Near Gate City, Virginia	03489900	79.6	1953-1977
Guest River, Near Coeburn, Virginia	03524500	87.30	1950-1971
Copper Creek, Near Gate City, Virginia	03526000	106.00	1948-1978
Middle Fork Holston River, At Seven Mile Ford, Virginia	03474000	132.00	1942-1978
Clinch River, At Richlands, Virginia	03521500	139.00	1946-1977
Middle Fork Holston River, Near Chilhowie, Virginia	03474500	155.00	1921-1931

Flood-frequency curves for these stations were computed using procedures outlined in Bulletin 17B, including adjustments for historic flood information where available (Reference 11). The results of these analyses were combined to develop the regional relationships applicable to Lee County.

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The regional relationship developed for streams within the Cumberland Plateau physiographic province was used to estimate flows on Straight Creek, Gin Creek, Big Branch, Baileys Trace, the North Fork Clinch River, Cane Creek, Dry Branch, Poor Valley Creek, and Fawn Branch. For Straight Creek and Baileys Trace, the regional relationships were combined with historic information and flood peaks estimated by watershed modeling (Reference 12). For the remainder of the ungaged study streams, flow estimates were based on the regional relationship developed for streams within the Valley and Ridge province.

Flow estimates based on the adopted regional relationships were compared to estimates made using relationships developed by the USGS for the region (Reference 13). For the range of drainage areas and channel slopes used in the hydrologic analysis, the discharges from the adopted regional relationship for the Cumberland Plateau streams are approximately 50 percent higher than the estimates from the USGS-developed relationship for Virginia hydrologic area F (applicable to Lee County). However, the discharges from the adopted regional relationship for the Valley and Ridge streams are approximately 30 percent lower than the estimates from Virginia hydrologic area F.

The differences between the adopted regional relationships and those of the USGS result mainly from the different gaged watersheds used in each analysis. The adopted relationships were determined from gaged watersheds with areas less than 200 square miles and within either the Cumberland Plateau or Valley and Ridge physiographic provinces.

The USGS relationships for Virginia hydrologic area F were developed using gages in the Valley and Ridge as well as Blue Ridge provinces. Most watersheds in the Valley and Ridge province are distinctly different than watersheds in the Cumberland Plateau. The Blue Ridge province is far enough from Lee County to be judged meteorologically different. Furthermore, approximately half the watersheds used in the USGS relationships were larger than 200 square miles and judged dissimilar to the watersheds of the study streams.

For the Powell River, the USGS gaging stations at Big Stone Gap (No. 03529500, 112 square miles, period of record 1945-1982) and near Jonesville (No. 03531500, 319 square miles, period of record 1932-1981) were the principal sources of data for defining discharge-frequency relationships. Peak discharge-frequency relationships for different locations were determined by interpolation between the gage points. Frequency curves for the gaging stations were computed using procedures outlined in Bulletin 17B, including adjustments for historic flood information (Reference 11).

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For the North Fork Powell River, the USGS gaging station at Pennington Gap (No. 03530500, 71.4 square miles, period of record 1945-present) was the principal source of data for defining discharge-frequency relationships. Upstream and downstream estimates were made by transfer using a flow-drainage area relationship through the gage points and parallel to the regional relationships described above. The frequency curve for the gaging station was computed using procedures in Bulletin 17B (Reference 11).

A summary of drainage area-peak discharge relationships for the streams studied by detailed methods is shown in Table 2, "Summary of Discharges."

TABLE 2 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
STRAIGHT CREEK					
At its confluence with the North Fork Powell River	27.7	4,550	7,890	10,100	14,100
Approximately 0.28 mile upstream of State Route 606	27.5	4,550	7,890	10,100	14,100
Approximately 0.29 mile downstream of State Route 606	16.5	2,980	5,140	6,380	9,080
Approximately 0.02 mile downstream of Puckett Creek	16.3	2,980	5,140	6,380	9,080
Approximately 0.02 mile upstream of Puckett Creek	13.4	2,520	4,300	5,300	7,600
Approximately 0.3 mile downstream of State Route 352	13.3	2,520	4,300	5,300	7,600
Approximately 0.93 mile downstream of Southern Railway	12.2	2,360	4,050	4,900	7,200
Approximately 0.02 mile downstream of Big Branch	12.2	2,360	4,050	4,900	7,200
Approximately 0.02 mile upstream of Big Branch	11.2	2,200	3,800	4,500	6,700
Approximately 0.02 mile downstream of Baileys Trace	11.1	2,200	3,800	4,500	6,700

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TABLE 2 - SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
STRAIGHT CREEK (continued)					
Approximately 0.02 mile upstream of Baileys Trace	6.9	1,480	2,450	2,950	4,400
Approximately 0.02 mile downstream of Gin Creek	6.0	1,330	2,200	2,630	3,890
Approximately 0.02 mile upstream of Gin Creek	3.5	800	1,320	1,590	2,330
At State Route 636	2.9	750	1,260	1,520	2,280
Approximately 0.6 mile upstream of State Route 636	1.5	490	840	1,020	1,540
GIN CREEK					
At its confluence with Straight Creek	2.6	660	1,100	1,320	1,970
Approximately 0.14 mile downstream of State Route 635	2.4	650	1,100	1,320	1,970
Approximately 0.93 mile upstream of State Route 635	1.5	505	870	1,050	1,590
BIG BRANCH					
At its confluence with Straight Creek	1.0	230	370	450	640
Approximately 0.41 mile upstream of State Route 628	0.7	170	290	350	490
BAILEYS TRACE					
At its confluence with Straight Creek	4.2	1,020	1,700	2,050	3,070
Approximately 0.02 mile downstream of Fawn Branch	3.9	1,020	1,700	2,050	3,070
Approximately 0.02 mile upstream of Fawn Branch	2.8	730	1,230	1,480	2,210
At State Route 717	2.3	670	1,140	1,380	2,060
Approximately 0.29 mile upstream of State Route 717	1.8	550	940	1,130	1,710

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TABLE 2 - SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
WALLEN CREEK					
Approximately 1.74 miles downstream of Dry Creek	17.9	1,260	2,010	2,380	3,370
Approximately 0.02 mile upstream of Dry Creek	14.8	1,060	1,710	2,030	2,890
Approximately 0.72 mile upstream of U. S. Route 58	10.4	780	1,270	1,520	2,180
DRY CREEK					
At its confluence with Wallen Creek	4.4	370	610	740	1,090
Approximately 0.2 mile upstream of State Route 738	3.6	310	520	630	940
NORTH FORK CLINCH RIVER					
Approximately 0.32 mile downstream of the county boundary	9.6	2,060	3,380	4,060	6,120
Approximately 0.02 mile downstream of Lovelady Creek	7.9	1,860	3,090	3,720	5,650
Approximately 0.02 mile upstream of Lovelady Creek	3.9	970	1,620	1,950	2,950
MUD CREEK					
Approximately 0.49 mile downstream of State Route 708	4.2	350	590	710	1,050
Approximately 0.28 mile upstream of State Route 622	0.5	60	100	130	200
POWELL RIVER					
Approximately 0.95 mile downstream of U. S. Route 421	291	23,100	37,100	44,200	64,000
Approximately 0.02 mile downstream of the North Fork Powell River	290	23,100	37,000	44,100	63,800

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TABLE 2 - SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
POWELL RIVER (continued)					
Approximately 0.02 mile upstream of the North Fork Powell River	200	17,000	27,500	32,900	48,100
Approximately 1.9 miles upstream of the North Fork Powell River	197	16,800	27,200	32,500	47,600
At State Route 619	187	16,100	26,100	31,200	45,800
Approximately 0.02 mile downstream of Poor Valley Creek	177	15,400	24,900	29,900	43,900
Approximately 0.02 mile upstream of Poor Valley Creek	174	15,200	24,600	29,500	43,300
POOR VALLEY BRANCH					
At its confluence with Martin Creek	6.2	500	830	990	1,450
Approximately 0.44 mile upstream of U. S. Route 58	2.3	210	360	440	660
INDIAN CREEK					
Approximately 0.02 mile downstream of Dry Branch	27.2	1,810	2,850	3,370	4,710
Approximately 0.02 mile upstream of Dry Branch	22.3	1,520	2,420	2,860	4,020
Approximately 0.02 mile downstream of Meek Branch	21.0	1,440	2,300	2,720	3,830
Approximately 0.02 mile upstream of Meek Branch	19.9	1,380	2,200	2,600	3,670
Approximately 0.02 mile downstream of Lick Branch	16.0	1,140	1,830	2,170	3,080
Approximately 0.02 mile upstream of Lick Branch	12.4	910	1,480	1,750	2,510
Approximately 0.02 mile downstream of Chances Branch	11.1	830	1,340	1,600	2,300
Approximately 0.02 mile upstream of Chances Branch	9.6	730	1,190	1,420	2,050

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TABLE 2 - SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
INDIAN CREEK (continued)					
Approximately 0.15 mile upstream of Louisville & Nashville Railroad	6.1	490	810	970	1,420
MARTIN CREEK					
Approximately 0.6 mile downstream of U. S. Route 58	6.6	530	870	1,040	1,510
Approximately 0.02 mile downstream of Poor Valley Branch	6.2	500	830	990	1,450
Approximately 0.2 mile downstream of U. S. Route 58	2.3	210	360	440	660
CANE CREEK					
At its confluence with the North Fork Powell River	7.2	1,000	1,600	1,900	2,700
Approximately 0.03 mile downstream of U. S. Route 58A	2.2	420	680	810	1,200
NORTH FORK POWELL RIVER					
At its confluence with the Powell River	90.2	10,200	16,500	19,800	29,800
Approximately 0.7 mile downstream of State Route 638	89.0	10,100	16,300	19,600	29,500
At the first upstream county boundary	84.5	9,600	15,500	18,700	28,100
Approximately 0.8 mile upstream of Louisville & Nashville Railroad	77.3	8,800	14,300	17,200	25,800
Approximately 0.02 mile upstream of Poor Valley Creek	73.6	8,400	13,700	16,500	24,700
Approximately 0.4 mile upstream of Old State Route 621	71.4	8,200	13,300	16,000	24,000

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TABLE 2 - SUMMARY OF DISCHARGES - continued

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
NORTH FORK POWELL RIVER (continued)					
Approximately 0.3 mile downstream of Straight Creek	70.6	8,100	13,200	15,800	23,800
Approximately 0.2 mile downstream of Straight Creek	42.9	5,100	8,300	10,000	14,900
FAWN BRANCH					
At its confluence with Baileys Trace	1.1	355	605	725	1,080
DRY BRANCH					
At its confluence with the North Fork Powell River	4.3	730	1,200	1,400	2,000
Approximately 0.02 mile downstream of Ely Creek	3.3	680	1,100	1,300	2,000
Approximately 0.02 mile upstream of Ely Creek	2.3	490	800	960	1,400
Approximately 0.86 mile downstream of U. S. Route 58A	1.5	400	670	800	1,200
Approximately 0.88 mile upstream of U. S. Route 58A	1.2	300	510	610	910
POOR VALLEY CREEK					
At its confluence with the North Fork Powell River	2.1	410	670	800	1,160
Approximately 1.44 miles upstream of State Route 621	0.8	220	370	440	650

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

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Cross sections were field surveyed at bridges and other strategic locations and were supplemented by valley cross sections obtained by photogrammetric methods (Reference 14). The photogrammetric methods involved the use of overlapping pairs of aerial photographs in a stereoplotter oriented between both exposures and with photo-identifiable points on a map base set in the frame of the output plotter. The aerial photographs were used to compile topographic maps, which were used to obtain additional cross sections (Reference 15).

The stereo models are controlled horizontally by existing map features and vertically by both existing and newly acquired surveyed elevations. Using the stereo model, coordinates of points along the cross sections were measured and recorded. The trace of the desired location of each section is on the output plotter. Cross sections were taken at close intervals to accurately compute water-surface elevations. All bridges and culverts were surveyed to obtain elevation data and structural geometry.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the Flood Insurance Rate Map (Exhibit 2).

Water-surface elevations of floods of the selected recurrence intervals were computed using the COE HEC-2 step-backwater computer program (Reference 16). Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals.

Starting water-surface elevations for Straight Creek, Gin Creek, Big Branch, Wallen Creek, Dry Creek, the North Fork Clinch River, Mud Creek, the Powell River, Poor Valley Branch, Indian Creek, Martin Creek, the North Fork Powell River, Fawn Branch, Dry Branch, and Poor Valley Creek were calculated by the slope/area method. Starting water-surface elevations for Baileys Trace were obtained from the Flood Insurance Study for the Town of St. Charles (Reference 17). Starting water-surface elevations for Cane Creek were obtained from the Flood Insurance Study for the Town of Pennington Gap (Reference 18).

Channel roughness factors (Manning's "n") used in the hydraulic computations were determined on the basis of field inspections of the channels and flood plain areas, previous studies by the TVA, and computed coefficients based on known flood profiles. The channel "n" and overbank "n" values for the streams studied by detailed methods are shown in Table 3.

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TABLE 3 - ROUGHNESS COEFFICIENTS

Stream	Channel "n"	Overbank "n"
Straight Creek	0.040-0.050	0.070-0.150
Gin Creek	0.035-0.045	0.100-0.150
Big Branch	0.035-0.050	0.070-0.150
Baileys Trace	0.040-0.045	0.090-0.150
Wallen Creek	0.035	0.060-0.100
Dry Creek	0.040-0.045	0.060-0.150
North Fork Clinch River	0.040-0.045	0.070-0.150
Mud Creek	0.035-0.040	0.070-0.130
Powell River	0.040-0.050	0.070-0.150
Poor Valley Branch	0.035-0.045	0.070-0.110
Indian Creek	0.030-0.050	0.070-0.150
Martin Creek	0.040-0.045	0.070-0.150
Cane Creek	0.045-0.060	0.050-0.120
North Fork Powell River	0.045-0.050	0.060-0.150
Fawn Branch	0.045	0.045-0.090
Dry Branch	0.045-0.060	0.060-0.120
Poor Valley Creek	0.045-0.060	0.060-0.120

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the maps; the descriptions of the marks are presented in Elevation Reference Marks (Exhibit 3).

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages State and local governments to adopt sound flood plain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100- and 500-year flood plain boundaries and 100-year floodway to assist communities in developing flood plain management measures.

4.1 Flood Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for flood plain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood

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risk in the community. For the streams studied in detail, the 100- and 500-year flood plain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:4,800 with a contour interval of 4 feet (Reference 15).

For the streams studied by approximate methods, the boundary of the 100-year flood was delineated using the Flood Hazard Boundary Map for Lee County (Reference 19).

The 100- and 500-year flood plain boundaries are shown on the Flood Insurance Rate Map (Exhibit 2). On this map, the 100-year flood plain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE), and the 500-year flood plain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 100- and 500-year flood plain boundaries are close together, only the 100-year flood plain boundary has been shown. Small areas within the flood plain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

4.2 Floodways

Encroachment on flood plains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood plain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent flood plain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this study were computed by setting encroachments in the stream overbanks, testing these with the HEC-2 program, adjusting and retesting them until an allowable increase in flood elevation is reached (Reference 16). This procedure has been used for many years to provide technical flood plain management assistance to Tennessee Valley communities.

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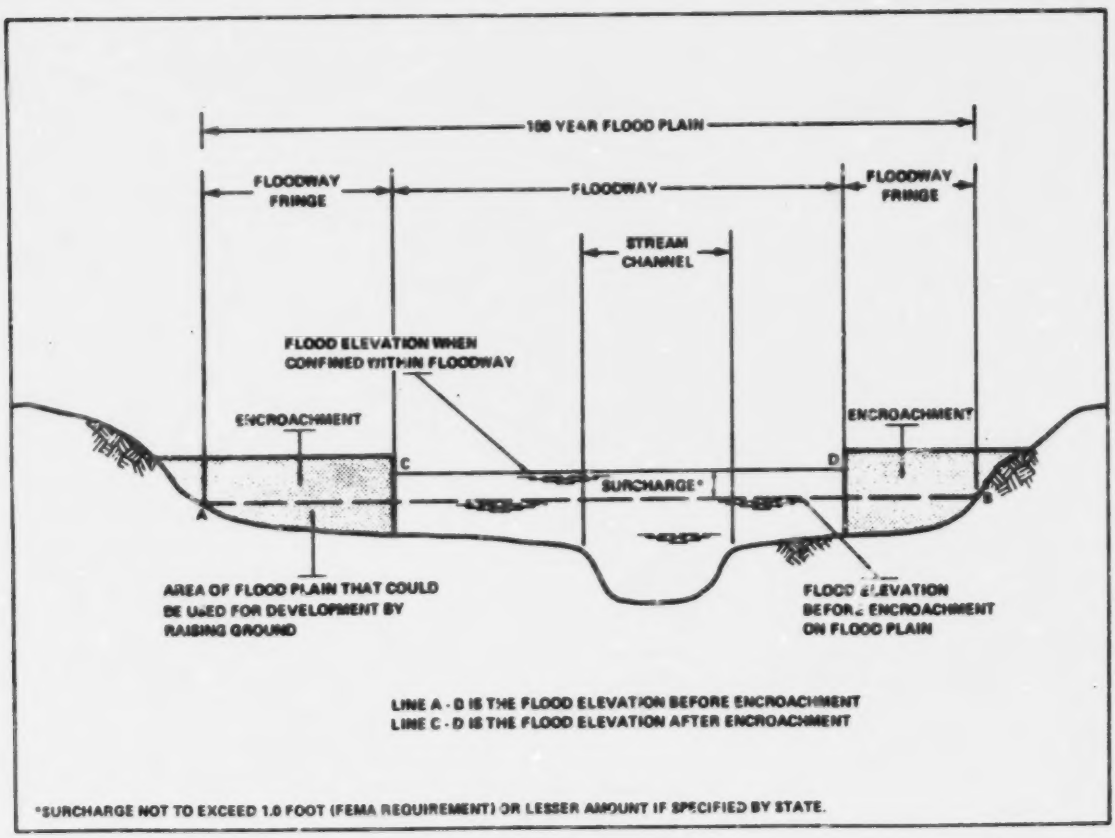
In this procedure the floodway limit lines are located to allow use of some presently flood-prone areas at the expense of some increased flood levels. The limit lines are located in a manner that provides land where it is estimated to serve the community's needs best. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (Table 4). The computed floodway is shown on the Flood Insurance Rate Map (Exhibit 2). In cases where the floodway and 100-year flood plain boundaries are either close together or collinear, only the floodway boundary is shown. Portions of the floodway widths for Big Branch and the North Fork Powell River extend beyond the county boundary.

The area between the floodway and 100-year flood plain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 2.


100 YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE*
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE A - D IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE C - D IS THE FLOOD ELEVATION AFTER ENCROACHMENT
*SURCHARGE NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE.

FLOODWAY SCHEMATIC Figure 2

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FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Straight Creek								
A	0.05[2]	175	887	11.4	1,437.9	1,437.9	1,438.2	0.3
B	0.12[2]	255	1,788	5.6	1,443.8	1,443.8	1,444.7	0.9
C	0.23[2]	120	808	12.5	1,445.6	1,445.6	1,446.1	0.5
D	0.46[2]	70	760	8.4	1,453.3	1,453.3	1,453.7	0.4
E	0.58[2]	115	951	6.7	1,456.4	1,456.4	1,457.4	1.0
F	0.74[2]	155	1,169	5.5	1,459.9	1,459.9	1,460.8	0.9
G	0.83[2]	135	1,044	5.1	1,462.5	1,462.5	1,463.1	0.6
H	1.00[2]	80	470	11.3	1,464.8	1,464.8	1,465.0	0.2
I	1.13[2]	105	691	7.7	1,471.2	1,471.2	1,472.0	0.8
J	1.23[2]	70	499	10.5	1,473.4	1,473.4	1,473.7	0.3
K	1.34[2]	150	748	7.0	1,477.0	1,477.0	1,477.1	0.1
L	1.50[2]	55	625	8.3	1,485.4	1,485.4	1,485.4	0.0
M	1.63[2]	90	854	6.0	1,486.7	1,486.7	1,487.1	0.4
N	1.73[2]	80	633	8.1	1,487.9	1,487.9	1,488.7	0.8
O	1.91[2]	80	548	9.2	1,492.9	1,492.9	1,493.8	0.9
P	2.05[2]	70	449	11.1	1,498.4	1,498.4	1,498.6	0.2
Q	2.18[2]	53	431	11.5	1,503.2	1,503.2	1,503.8	0.6
R	2.28[2]	55	494	10.0	1,506.8	1,506.8	1,507.5	0.7
S	2.33[2]	45	652	7.5	1,516.4	1,516.4	1,516.8	0.4
T	2.40[2]	70	756	6.5	1,517.2	1,517.2	1,517.7	0.5
U	2.55[2]	65	536	9.1	1,519.7	1,519.7	1,519.9	0.2
V	3.14[2]	125	531	5.4	1,543.0	1,543.0	1,543.3	0.3
W	3.19[2]	103	352	8.1	1,543.7	1,543.7	1,544.0	0.3

[1]Stream distances represent established TVA river miles and may not reflect actual distances shown on the map

[2]Miles above confluence with North Fork Powell River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

FLOODWAY DATA

STRAIGHT CREEK

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FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Straight Creek (continued)								
X	3.30[2]	45	273	10.3	1,548.5	1,548.5	1,548.9	0.4
Y	3.34[2]	95	698	4.0	1,553.9	1,553.9	1,554.0	0.1
Z	3.44[2]	77	219	12.7	1,555.2	1,555.2	1,555.2	0.0
AA	3.48[2]	95	507	5.5	1,560.2	1,560.2	1,560.4	0.2
AB	3.72[2]	50	224	12.1	1,570.5	1,570.5	1,570.5	0.0
AC	3.94[2]	72	365	7.3	1,585.8	1,585.8	1,585.8	0.0
AD	4.02[2]	45	307	5.2	1,596.7	1,596.7	1,597.5	0.8
AE	4.17[2]	29	128	12.3	1,605.7	1,605.7	1,605.7	0.0
AF	4.43[2]	23	145	10.6	1,629.4	1,629.4	1,630.2	0.8
AG	4.64[2]	26	196	7.7	1,645.9	1,645.9	1,646.3	0.4
AH	4.70[2]	45	234	6.4	1,650.4	1,650.4	1,651.3	0.9
AI	4.81[2]	48	292	4.9	1,661.9	1,661.9	1,662.5	0.6
AJ	4.90[2]	38	173	8.0	1,669.7	1,669.7	1,669.7	0.0
AK	4.94[2]	75	293	4.7	1,675.8	1,675.8	1,676.3	0.5
AL	5.01[2]	30	130	10.3	1,680.3	1,680.3	1,680.3	0.0
AM	5.10[2]	19	148	8.7	1,686.4	1,686.4	1,686.7	0.3
AN	5.40[2]	29	119	9.6	1,719.4	1,719.4	1,719.8	0.4
AO	5.61[2]	23	89	11.5	1,750.1	1,750.1	1,750.1	0.0
Gin Creek								
A	0.01[3]	54	261	5.1	1,589.1	1,589.1	1,590.1	1.0
B	0.20[3]	35	121	10.9	1,601.6	1,601.6	1,601.6	0.0

[1]Stream distances represent established TVA river miles and may not reflect actual distances as shown on the map

[2]Miles above confluence with North Fork Powell River

[3]Miles above confluence with Straight Creek

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

FLOODWAY DATA

STRAIGHT CREEK - GIN CREEK

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FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY	INCREASE
Gin Creek (continued)								
C	0.32[2]	40	279	4.7	1,615.4	1,615.4	1,616.1	0.7
D	0.36[2]	50	233	5.7	1,615.9	1,615.9	1,616.6	0.7
E	0.49[2]	28	190	6.8	1,629.7	1,629.7	1,630.2	0.5
F	0.74[2]	35	116	10.6	1,650.9	1,650.9	1,650.9	0.0
G	0.84[2]	40	130	9.2	1,660.5	1,660.5	1,660.5	0.0
H	1.03[2]	50	227	5.1	1,687.2	1,687.2	1,688.1	0.9
I	1.21[2]	35	112	9.9	1,708.6	1,708.6	1,708.6	0.0
J	1.33[2]	50	187	5.7	1,726.3	1,726.3	1,726.3	0.0
K	1.41[2]	25	92	11.4	1,735.5	1,735.5	1,735.5	0.0
Big Branch								
A	0.04[2]	8/4[3]	59	7.5	1,530.9	1,530.9	1,531.6	0.7
B	0.10[2]	11/5[3]	40	11.0	1,539.8	1,539.8	1,539.8	0.0
C	0.12[2]	27/15[3]	52	8.4	1,547.2	1,547.2	1,547.2	0.0
D	0.23[2]	17/7[3]	45	9.3	1,573.3	1,573.3	1,573.3	0.0
E	0.25[2]	30	90	4.6	1,579.0	1,579.0	1,579.1	0.1
F	0.30[2]	10	39	10.6	1,583.5	1,583.5	1,583.5	0.0
G	0.34[2]	20	57	7.1	1,592.7	1,592.7	1,592.7	0.0
H	0.38[2]	12	41	9.7	1,596.9	1,596.9	1,596.9	0.0
I	0.40[2]	20	80	5.0	1,602.2	1,602.2	1,602.7	0.5
J	0.45[2]	20	47	8.3	1,609.9	1,609.9	1,609.9	0.0

[1]Stream distances represent established TVA river miles and may not reflect actual distances as shown on the map

[2]Miles above confluence with Straight Creek

[3]Width/width within county boundary

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

FLOODWAY DATA

GIN CREEK - BIG BRANCH

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FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Big Branch (continued)								
K	0.59[2]	30	99	3.7	1,625.2	1,625.2	1,625.5	0.3
L	0.75[2]	22	58	6.9	1,635.8	1,635.8	1,635.8	0.0
Baileys Trace								
A	0.34[2]	47	184	11.2	1,542.9	1,542.9	1,542.9	0.0
B	0.59[2]	45	183	11.2	1,560.1	1,560.1	1,560.2	0.1
C	0.66[2]	42	348	5.9	1,569.1	1,569.1	1,569.3	0.2
D	0.79[2]	75	312	4.7	1,579.5	1,579.5	1,580.5	1.0
E	0.96[2]	35	159	9.1	1,591.0	1,591.0	1,591.4	0.4
F	1.26[2]	35	114	12.2	1,618.6	1,618.6	1,618.6	0.0
G	1.35[2]	31	266	5.2	1,634.3	1,634.3	1,634.6	0.3
H	1.47[2]	40	121	10.8	1,640.3	1,640.3	1,640.4	0.1
I	1.64[2]	35	103	10.9	1,660.8	1,660.8	1,660.9	0.1
Wallen Creek								
A	25.36[3]	70	433	5.4	1,567.3	1,567.3	1,568.2	0.9
B	25.77[3]	80	281	8.0	1,576.8	1,576.8	1,576.8	0.0
C	26.31[3]	105	512	4.2	1,590.9	1,590.9	1,591.8	0.9
D	26.74[3]	70	317	6.6	1,604.9	1,604.9	1,604.9	0.0
E	27.16[3]	50	260	5.8	1,623.8	1,623.8	1,623.8	0.0
F	27.57[3]	40	255	6.0	1,628.7	1,628.7	1,629.5	0.8

[1]Stream distances represent established TVA river miles and may not reflect actual distances as shown on the map

[2]Miles above confluence with Straight Creek

[3]Miles above confluence with Powell River

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TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

FLOODWAY DATA

BIG BRANCH - BAILEYS TRACE - WALLEN CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Dry Creek								
A	0.04[2]	45	143	5.2	1,616.8	1,616.8	1,617.4	0.6
B	0.17[2]	50	173	4.2	1,625.8	1,625.8	1,625.8	0.0
C	0.32[2]	50	207	3.5	1,639.9	1,639.9	1,640.9	1.0
D	0.62[2]	41	80	8.6	1,667.4	1,667.4	1,667.4	0.0
E	1.20[2]	45	236	2.7	1,744.4	1,744.4	1,744.4	0.0
F	1.41[2]	40	226	2.8	1,773.3	1,773.3	1,773.3	0.0
G	1.45[2]	31	172	3.7	1,778.6	1,778.6	1,778.6	0.0
North Fork Clinch River								
A	25.82[3]	40	342	11.6	1,483.9	1,483.9	1,484.3	0.4
B	26.36[3]	160	676	5.6	1,505.5	1,505.5	1,506.3	0.8
C	26.52[3]	180	907	2.2	1,514.5	1,514.5	1,515.1	0.6
D	26.64[3]	61	187	10.4	1,528.5	1,528.5	1,528.5	0.0
E	26.66[3]	45	386	5.1	1,534.8	1,534.8	1,534.8	0.0
Mud Creek								
A	1.09[4]	140	457	1.1	1,460.8	1,460.8	1,461.8	1.0
B	1.52[4]	80	94	3.8	1,464.6	1,464.6	1,464.6	0.0
C	1.82[4]	60	184	1.3	1,470.8	1,470.8	1,471.1	0.3
D	2.04[4]	20	63	2.5	1,475.2	1,475.2	1,476.0	0.8
E	2.12[4]	20	38	3.4	1,475.8	1,475.8	1,476.5	0.7

[1]Stream distances represent established TVA river miles and may not reflect actual distances as shown on the map

[2]Miles above confluence with Wallen Creek

[3]Miles above confluence with Clinch River

[4]Miles above confluence with Powell River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

FLOODWAY DATA

DRY CREEK - NORTH FORK CLINCH RIVER - MUD CREEK

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Powell River								
A	155.57[2]	260	6,807	6.5	1,339.1	1,339.1	1,340.1	1.0
B	156.17[2]	280	7,637	5.8	1,341.0	1,341.0	1,342.0	1.0
C	156.55[2]	280	8,790	5.0	1,344.3	1,344.3	1,345.1	0.8
D	157.16[2]	190	5,020	6.6	1,347.1	1,347.1	1,348.1	1.0
E	157.52[2]	150	4,702	7.0	1,348.4	1,348.4	1,349.4	1.0
F	165.74[2]	480	4,527	6.8	1,391.1	1,391.1	1,391.2	0.1
G	166.20[2]	350	3,779	8.1	1,396.7	1,396.7	1,397.7	1.0
H	166.93[2]	270	4,162	7.3	1,405.5	1,405.5	1,405.9	0.4
I	167.41[2]	270	3,278	9.2	1,408.8	1,408.8	1,409.3	0.5
J	168.00[2]	400	6,660	4.5	1,413.2	1,413.2	1,414.2	1.0
Poor Valley Branch								
A	0.02[3]	30	160	4.2	1,392.7	1,392.4[4]	1,392.4	0.0
B	0.26[3]	35	134	4.6	1,395.5	1,395.5	1,395.9	0.4
C	0.34[3]	40	151	4.0	1,396.3	1,396.3	1,396.9	0.6
D	0.54[3]	30	100	5.6	1,399.4	1,399.4	1,400.4	1.0
E	0.72[3]	30	110	4.8	1,405.8	1,405.8	1,405.8	0.0

[1]Stream distances represent established TVA river miles and may not reflect actual distances as shown on the map

[2]Miles above confluence with Clinch River

[3]Miles above confluence with Martin Creek

[4]Elevation computed without consideration of backwater from Martin Creek

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

FLOODWAY DATA

POWELL RIVER - POOR VALLEY BRANCH

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Indian Creek								
A	17.12[2]	65	653	5.2	1,309.0	1,309.0	1,309.3	0.3
B	17.27[2]	65	689	4.9	1,310.5	1,310.5	1,310.8	0.3
C	17.44[2]	55	594	5.7	1,311.4	1,311.4	1,311.7	0.3
D	17.78[2]	80	794	4.2	1,313.6	1,313.6	1,314.3	0.7
E	18.36[2]	60	604	5.6	1,317.7	1,317.7	1,318.7	1.0
F	18.69[2]	55	543	5.3	1,320.9	1,320.9	1,321.5	0.6
G	18.98[2]	100	551	5.1	1,324.3	1,324.3	1,324.5	0.2
H	19.22[2]	55	545	5.1	1,327.7	1,327.7	1,327.8	0.1
I	19.44[2]	50	402	6.9	1,329.[illegible]	1,329.6	1,330.0	0.4
J	19.63[2]	45	394	6.9	1,332.6	1,332.6	1,333.5	0.9
K	19.86[2]	60	517	5.0	1,336.3	1,336.3	1,337.2	0.9
L	20.07[2]	90	572	4.5	1,339.4	1,339.4	1,340.2	0.8
M	20.10[2]	50	248	10.3	1,345.6	1,345.6	1,345.7	0.1
N	20.45[2]	60	520	4.8	1,351.6	1,351.6	1,352.0	0.4
O	20.78[2]	60	594	4.1	1,353.5	1,353.5	1,354.0	0.5
P	21.02[2]	110	766	3.2	1,354.6	1,354.6	1,355.3	0.7
Q	21.25[2]	50	496	4.8	1,355.6	1,355.6	1,356.5	0.9
R	21.50[2]	50	484	4.9	1,357.7	1,357.7	1,358.6	0.9
S	21.66[2]	50	479	4.9	1,358.9	1,358.9	1,359.8	0.9
T	21.82[2]	80	697	3.3	1,360.0	1,360.0	1,361.0	1.0
U	21.97[2]	75	725	3.2	1,362.0	1,362.0	1,362.6	0.6
V	21.99[2]	50	376	6.1	1,365.1	1,365.1	1,365.3	0.2
W	22.14[2]	70	452	5.0	1,366.4	1,366.4	1,366.6	0.2

[1]Stream distances represent established TVA river miles and may not reflect actual distances as shown on the map

[2]Miles above confluence with Powell River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA

(UNINCORPORATED AREAS)

FLOODWAY DATA

INDIAN CREEK

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Indian Creek (continued)								
X	22.57[2]	110	659	3.4	1,370.2	1,370.2	1,370.7	0.5
Y	22.90[2]	90	339	5.2	1,372.7	1,372.7	1,373.6	0.9
Z	23.02[2]	50	414	4.2	1,375.3	1,375.3	1,375.7	0.4
AA	23.25[2]	85	670	2.6	1,376.4	1,376.4	1,377.2	0.8
AB	23.40[2]	80	596	2.8	1,376.9	1,376.9	1,377.9	1.0
AC	23.84[2]	50	412	4.0	1,379.7	1,379.7	1,380.5	0.8
AD	23.98[2]	100	740	2.2	1,381.0	1,381.0	1,381.8	0.8
AE	24.21[2]	100	623	2.6	1,381.7	1,381.7	1,382.7	1.0
AF	24.44[2]	90	464	3.0	1,384.6	1,384.6	1,385.1	0.5
AG	24.73[2]	80	386	3.3	1,388.2	1,388.2	1,388.4	0.2
AH	24.97[2]	40	237	5.1	1,392.0	1,392.0	1,392.4	0.4
AI	25.03[2]	130	386	3.1	1,393.3	1,393.3	1,393.6	0.3
AJ	25.27[2]	180	756	1.5	1,395.1	1,395.1	1,395.7	0.6
AK	25.39[2]	40	232	4.6	1,396.4	1,396.4	1,397.2	0.8
AL	25.47[2]	70	328	3.[illegible]	1,398.0	1,398.0	1,398.7	0.7
AM	25.55[2]	100	514	2.0	1,399.3	1,399.3	1,400.3	1.0
AN	25.67[2]	25	192	5.1	1,400.1	1,400.1	1,400.8	0.7

[1]Stream distances represent established TVA river miles and may not reflect actual distances as shown on the map

[2]Miles above confluence with Powell River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

FLOODWAY DATA

INDIAN CREEK

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Martin Creek								
A	8.62[2]	30	175	6.0	1,390.8	1,390.8	1,391.1	0.3
B	8.71[2]	25	113	3.9	1,393.4	1,393.4	1,394.0	0.6
C	8.74[2]	50	286	1.5	1,394.1	1,394.1	1,395.1	1.0
D	8.86[2]	30	118	3.7	1,396.5	1,396.5	1,397.5	1.0
E	9.02[2]	35	117	3.7	1,402.2	1,402.2	1,402.2	0.0
F	9.16[2]	20	76	5.8	1,404.0	1,404.0	1,405.0	1.0
Cane Creek								
A	2.10[3]	130	577	2.5	1,373.9	1,373.9	1,374.8	0.9
B	2.62[3]	100	402	3.4	1,383.8	1,383.8	1,384.3	0.5
C	2.69[3]	30	180	7.5	1,388.1	1,388.1	1,388.1	0.0
D	2.74[3]	70	481	2.8	1,389.5	1,389.5	1,389.7	0.2
E	2.85[3]	100	528	2.5	1,390.4	1,390.4	1,391.0	0.6
F	3.02[3]	120	576	2.2	1,391.3	1,391.3	1,392.2	0.9
G	3.06[3]	120	690	1.9	1,393.2	1,393.2	1,393.7	0.5
H	3.10[3]	160	830	1.5	1,393.6	1,393.6	1,394.4	0.8
I	3.35[3]	120	301	4.1	1,394.8	1,394.8	1,395.6	0.8
J	3.45[3]	90	358	3.4	1,398.0	1,398.0	1,398.5	0.5
K	3.56[3]	90	323	3.7	1,400.2	1,400.2	1,400.5	0.3
L	3.87[3]	100	398	2.8	1,406.1	1,406.1	1,407.0	0.9
M	4.21[3]	100	272	3.9	1,414.0	1,414.0	1,415.0	1.0
N	4.43[3]	50	203	5.0	1,422.0	1,422.0	1,422.9	0.9
O	4.50[3]	50	198	5.0	1,424.8	1,424.8	1,425.3	0.5

[1]Stream distances represent established TVA river miles and may not reflect actual distances as shown on the map

[2]Miles above confluence with Powell River

[3]Miles above confluence with North Fork Powell River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

FLOODWAY DATA

MARTIN CREEK - CANE CREEK

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
						(FEET NGVD)		
Cane Creek (continued)								
P	4.57[2]	60	209	4.6	1,427.3	1,427.3	1,427.6	0.3
Q	4.94[2]	40	176	5.1	1,444.2	1,444.2	1,444.3	0.1
R	5.06[2]	40	148	6.0	1,449.2	1,449.2	1,449.8	0.6
S	5.17[2]	60	287	3.0	1,454.5	1,454.5	1,455.5	1.0
T	5.30[2]	50	92	9.1	1,457.9	1,457.9	1,457.9	0.0
U	5.43[2]	220	703	1.2	1,464.1	1,464.1	1,465.1	1.0
V	5.50[2]	30	126	6.4	1,465.7	1,465.7	1,466.5	0.8

[1]Stream distances represent established TVA river miles and may not reflect actual distances as shown on the map

[2]Miles above confluence with North Fork Powell River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

FLOODWAY DATA

CANE CREEK

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
North Fork Powell River								
A	0.15[2]	130	2,217	8.9	1,344.8	1,335.0[4]	1,335.1	0.1
B	0.55[2]	130	2,614	7.6	1,344.8	1,338.4[4]	1,338.5	0.1
C	0.80[2]	140	2,217	8.9	1,344.8	1,340.2[4]	1,340.5	0.3
D	1.20[2]	180	3,297	6.0	1,344.8	1,344.1[4]	1,344.4	0.3
E	1.42[2]	180	2,336	8.4	1,345.1	1,345.1	1,345.5	0.4
F	1.60[2]	190	2,691	7.3	1,347.7	1,347.7	1,348.3	0.6
G	1.97[2]	250	3,654	5.1	1,351.5	1,351.5	1,352.5	1.0
H	2.02[2]	260	3,238	5.8	1,352.0	1,352.0	1,353.0	1.0
I	2.62[2]	540/150[3]	6,717	2.5	1,355.4	1,355.4	1,356.4	1.0
J	2.93[2]	690	6,433	2.6	1,356.1	1,356.1	1,357.1	1.0
K	3.15[2]	690	5,372	3.1	1,356.9	1,356.9	1,357.9	1.0
L	3.37[2]	690	3,514	4.8	1,358.7	1,358.7	1,359.5	0.8
M	3.57[2]	750	4,440	3.8	1,361.9	1,361.9	1,362.3	0.4
N	3.80[2]	1000/850[3]	5,526	3.0	1,365.4	1,365.4	1,365.5	0.1
O	4.43[2]	700	4,190	3.8	1,373.1	1,373.1	1,374.1	1.0
P	4.55[2]	200	1,946	8.2	1,375.8	1,375.8	1,376.4	0.6
Q	4.66[2]	120	1,539	10.4	1,378.4	1,378.4	1,378.7	0.3
R	4.67[2]	120	1,521	10.5	1,378.5	1,378.5	1,379.0	0.5
S	4.92[2]	100	1,139	14.0	1,386.9	1,386.9	1,387.3	0.4
T	5.05[2]	100	1,396	11.4	1,395.2	1,395.2	1,396.1	0.9
U	5.22[2]	100	1,310	12.2	1,400.7	1,400.7	1,401.0	0.3
V	5.50[2]	100	1,425	11.1	1,416.8	1,416.8	1,417.0	0.2

[1]Stream distances represent established TVA river miles and may not reflect actual distances as shown on the map

[2]Miles above confluence with Powell River

[3]Width/width within county boundary

[4]Elevation computed without consideration of backwater from Powell River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

FLOODWAY DATA

NORTH FORK POWELL RIVER

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
North Fork Powell River (continued)								
W	5.68[2]	100	1,444	11.0	1,420.9	1,420.9	1,421.5	0.6
X	6.01[2]	100	1,123	14.1	1,433.2	1,433.2	1,434.0	0.8
Fawn Branch								
A	0.01[3]	50	84	8.6	1,570.5	1,568.1[4]	1,568.1	0.0
B	0.15[3]	40	80	9.1	1,582.0	1,582.0	1,582.0	0.0
C	0.28[3]	28	75	9.5	1,606.1	1,606.1	1,606.1	0.0
D	0.31[3]	40	184	3.9	1,617.7	1,617.7	1,617.7	0.0
E	0.40[3]	21	68	10.3	1,623.8	1,623.8	1,623.8	0.0
F	0.52[3]	25	60	11.4	1,645.4	1,645.4	1,645.4	0.0
G	0.67[3]	35	75	9.0	1,666.1	1,666.1	1,666.4	0.3
H	0.87[3]	35	79	8.3	1,704.6	1,704.6	1,704.6	0.0
I	1.09[3]	35	62	9.5	1,755.9	1,755.9	1,755.9	0.0

[1]Stream distances represent established TVA river miles and may not reflect actual distances as shown on the map
[2]Miles above confluence with Powell River
[3]Miles above confluence with Baileys Trace
[4]Elevation computed without consideration of backwater from Baileys Trace

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

FLOODWAY DATA

NORTH FORK POWELL RIVER - FAWN BRANCH

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Dry Branch								
A	0.14[2]	40	369	3.8	1,351.2	1,348.7[3]	1,348.7	0.0
B	0.34[2]	50	250	5.5	1,351.2	1,349.7[3]	1,350.7	1.0
C	0.36[2]	65	448	3.1	1,353.1	1,353.1	1,354.1	1.0
D	0.60[2]	80	347	3.9	1,357.8	1,357.8	1,358.8	1.0
E	0.79[2]	30	224	6.0	1,366.7	1,366.7	1,366.7	0.0
F	1.06[2]	35	159	8.3	1,375.0	1,375.0	1,375.2	0.2
G	1.33[2]	40	221	5.9	1,386.6	1,388.6	1,388.7	0.1
H	1.62[2]	65	293	3.1	1,406.9	1,406.9	1,407.1	0.2
I	1.72[2]	50	240	3.8	1,412.8	1,412.8	1,413.4	0.6
J	1.91[2]	50	159	5.5	1,422.6	1,422.6	1,423.4	0.8
K	2.02[2]	35	145	6.0	1,431.6	1,431.6	1,431.6	0.0
L	2.17[2]	35	166	5.1	1,446.7	1,446.7	1,446.7	0.0
M	2.29[2]	35	136	6.1	1,455.8	1,455.8	1,455.8	0.0
N	2.44[2]	35	144	5.6	1,473.1	1,473.1	1,473.1	0.0
O	2.52[2]	30	86	7.1	1,482.1	1,482.1	1,482.4	0.3
Poor Valley Creek								
A	0.03[2]	60	294	2.7	1,375.5	1,375.5	1,376.4	0.9
B	0.07[2]	45	243	3.2	1,376.5	1,376.5	1,377.4	0.9
C	0.14[2]	50	142	5.4	1,380.7	1,380.7	1,380.7	0.0
D	0.42[2]	30	90	8.1	1,404.2	1,404.2	1,404.3	0.1
E	0.62[2]	35	208	3.4	1,428.6	1,428.6	1,428.6	0.0

[1]Stream distances represent established TVA river miles and may not reflect actual distances as shown on the map

[2]Miles above confluence with North Fork Powell River

[3]Elevation computed without consideration of backwater from North Fork Powell River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

FLOODWAY DATA

DRY BRANCH - POOR VALLEY CREEK

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FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Poor Valley Creek (continued)								
F	0.73[2]	40	97	7.0	1,443.9	1,443.9	1,444.0	0.1
G	0.76[2]	60	334	2.0	1,446.2	1,446.2	1,447.1	0.9
H	0.86[2]	35	191	3.5	1,456.2	1,456.2	1,457.1	0.9
I	0.95[2]	35	171	3.8	1,471.3	1,471.3	1,472.1	0.8
J	1.06[2]	35	145	4.3	1,481.8	1,481.8	1,482.6	0.8
K	1.10[2]	50	234	2.6	1,485.7	1,485.7	1,486.6	0.9
L	1.13[2]	30	132	4.7	1,489.1	1,489.1	1,490.1	1.0
M	1.20[2]	35	167	3.6	1,497.2	1,497.2	1,498.0	0.8
N	1.30[2]	25	145	4.1	1,509.2	1,509.2	1,510.0	0.8
O	1.35[2]	35	142	4.1	1,516.3	1,516.3	1,517.2	0.9
P	1.49[2]	35	100	5.6	1,524.5	1,524.5	1,525.1	0.6
Q	1.67[2]	30	122	4.3	1,544.2	1,544.2	1,544.9	0.7
R	1.78[2]	30	86	6.0	1,556.2	1,556.2	1,556.4	0.2
S	2.02[2]	35	108	4.5	1,576.3	1,576.3	1,577.2	0.9
T	2.11[2]	20	57	8.0	1,585.0	1,585.0	1,585.7	0.7
U	2.26[2]	20	74	5.9	1,599.8	1,599.8	1,600.5	0.7

[1]Stream distances represent established TVA river miles and may not reflect actual distances as shown on the map

[2]Miles above confluence with North Fork Powell River

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

FLOODWAY DATA

POOR VALLEY CREEK

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Near the mouths of streams studied in detail, floodway computations are made without regard to flood elevations on the receiving water body. Therefore, "Without Floodway" elevations presented in Table 4 for certain downstream cross sections of Poor Valley Branch, the North Fork Powell River, and Fawn Branch, Dry Branch are lower than the regulatory flood elevations in that area, which must take into account the 100-year flooding due to backwater from other sources.

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year flood plains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown in this area.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year flood plains that are determined in the Flood Insurance Study by detailed methods. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the detailed hydraulic analyses are shown within this zone.

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Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year flood plain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 100-year coastal flood plains that have additional hazards associated with storm waves. Zone V areas are determined by approximate methods, and base flood elevations are not shown.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal flood plains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year flood plain, areas within the 500-year flood plain, and to areas of 100-year shallow flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and flood plain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year flood plains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

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For flood plain management applications, the map shows by tints, screens, and symbols, the 100- and 500-year flood plains, the floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

7.0 OTHER STUDIES

A flood report for Straight Creek and its tributaries in the vicinity of St. Charles was prepared by the TVA for the Commonwealth of Virginia (Reference 12). It was used as a source of hydrologic and hydraulic data for this study.

Flood Insurance Studies for the Town of Jonesville and the unincorporated areas of Wise County have been completed (References 20 and 21). The results of this study are in exact agreement with the results of the Jonesville study. At the Wise County-Lee County boundary, the Powell River was studied by detailed methods in the Wise County study and by approximate methods in this study. Therefore, the zones do not match between studies, but the 100-year flood boundaries are in agreement.

Flood Insurance Studies for the Towns of St. Charles and Pennington Gap are currently being prepared (References 17 and 18). The results of those studies will be in exact agreement with the results of this study.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting the Natural and Technological Hazards Division, FEMA, Liberty Square Building (Second Floor), 105 South Seventh Street, Philadelphia, Pennsylvania 19106.

9.0 BIBLIOGRAPHY AND REFERENCES

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2. U. S. Department of Commerce, National Oceanic and Atmospheric Administration, Environmental Data Service, Monthly Averages of Temperature and Precipitation for State (Virginia) Climatic Divisions, Asheville, North Carolina, National Climatic Center, 1951-1980.

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10. U. S. Department of Housing and Urban Development, Federal Insurance Administration, "Code of Federal Regulations, Title 24, Chapter 10, Parts 1910.3A and 3B," Federal Register, Volume 41, No. 207, Washington, D. C., Revised 1976.

11. U. S. Department of the Interior, Geological Survey, Office of Water Data Collection, Interagency Advisory Committee on Water Data, "Guidelines for Determining Flood Flow Frequency," Bulletin 17B, Reston, Virginia, Revised September 1981.

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19. U. S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, Unincorporated Areas of Lee County, Virginia, June 30, 1978.

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EXHIBIT 3 - ELEVATION REFERENCE MARKS

Reference Mark	FIRM Panel	Elevation (Feet NGVD)	Description of Location
RM 1	09	1,683.81	Standard disk set in concrete on east bank of Gin Creek at river mile 1.03, located in front yard of house north of wooden footbridge, south of private drive bridge, east of steel fencepost.
RM 2	09	1,631.25	Standard disk set in top of northeast concrete guardrail at southeast end of State Route 634 bridge over Gin Creek, river mile 0.49.
RM 3	09	1,728.02	Standard disk set in floor of State Route 636 bridge over Millers Cove Creek 100 feet upstream from confluence with Straight Creek, river mile 5.44.
RM 4	09	1,678.28	Standard disk set in southeast upstream wing wall of State Route 636 bridge over Straight Creek, river mile 5.01.
RM 5	09	1,643.66	Standard disk set in west wing wall at southwest end of State Route 636 bridge over Straight Creek, river mile 4.64.
RM 6	27	1,628.48	Standard disk set in concrete monument on west bank of Straight Creek, river mile 4.43, 25 feet upstream from end of rock wall, 24 feet from telephone pole.

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EXHIBIT 3 - ELEVATION REFERENCE MARKS

Reference Mark	FIRM Panel	Elevation (Feet NGVD)	Description of Location
RM 7	27	1,585.16	Standard disk set in west end of north headwall of Southern Railway bridge over Straight Creek, river mile 3.94.
RM 8	27	1,557.83	Standard disk set in west end of south headwall of county road bridge over Straight Creek, river mile 3.48.
RM 9	27	1,540.13	Standard disk set in north wing wall on west end of private drive bridge to coal mine over Straight Creek, river mile 3.14.
RM 10	27	1,515.71	Standard disk in southwest end of northeast headwall of Southern Railway bridge over Straight Creek, river mile 2.33.
RM 11	27	1,586.30	Standard disk set in west wing wall at south end of State Route 636 bridge over Gin Creek, river mile 0.01.
RM 12	27	1,634.24	Standard disk set in northwest wing wall at northeast end of State Route 717 bridge over Baileys Trace, river mile 1.35.
RM 13	27	1,569.70	Standard disk set in southeast wing wall at south end of State Route 634 bridge over Baileys Trace, river mile 0.66.

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EXHIBIT 3 - ELEVATION REFERENCE MARKS

Reference Mark	FIRM Panel	Elevation (Feet NGVD)	Description of Location
RM 14	29	1,475.43	Standard disk in concrete base of railroad signal post, 5 feet north of the south end of State Route 352 bridge over Straight Creek, river mile 1.13.
RM 15	29	1,442.35	Standard monument set in northeast end of curb on southeast side of State Route 606 bridge over Straight Creek, river mile 0.12.
RM 16	29	1,403.93	G-321 standard cap in top of west corner of southwest masonry steel pier south of U. S. Route 421 at North Fork Powell River, river mile 5.21.
RM 17	29	1,378.61	Standard monument set in west end of concrete bridge floor near south guardrail on new State Route 621 bridge over North Fork Powell River, river mile 4.55.
RM 18	29	1,373.00	Chiseled square on concrete pad on west bank of North Fork Powell River, river mile 4.29, on ledge going into river approximately 90 feet east of centerline of U. S. Route 421.
RM 19	29	1,444.31	Standard monument set in west wing wall at north end of State Route 621 bridge over Poor Valley Creek, river mile 0.76.

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EXHIBIT 3 - ELEVATION REFERENCE MARKS

Reference Mark	FIRM Panel	Elevation (Feet NGVD)	Description of Location
RM 20	29	1,557.44	Standard monument set in northwest end of curb on northeast side of private drive bridge over Poor Valley Creek, river mile 1.80, approximately 130 feet northwest of intersection of private drive and State Route 621.
RM 21	33	1,483.16	Standard monument set in south side of east headwall of county road bridge over Dry Branch, river mile 2.50.
RM 22	33	1,474.07	60d nail in east side of private drive bridge floor over centerline of Dry Branch, river mile 2.44, approximately 30 feet northwest of U. S. Route 58A.
RM 23	33	1,433.91	Top of bolt on southeast end of east curb on private drive bridge over Dry Branch, river mile 2.02.
RM 24	33	1,390.44	Standard monument set in south curb at east end of U. S. Route 58A bridge over Ely Creek near Ely Church, river mile 1.33.
RM 25	33	1,357.36	Bent 0.5-inch rebar on east wing wall at northwest end of private drive over Dry Branch, river mile 0.60.

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EXHIBIT 3 - ELEVATION REFERENCE MARKS

Reference Mark	FIRM Panel	Elevation (Feet NGVD)	Description of Location
RM 26	33	1,341.69	Chiseled square on west bank of Dry Branch approximately 60 feet north of Louisville and Nashville Railroad bridge over Dry Branch, second level up from ground, river mile 0.14.
RM 27	33	1,350.09	Standard monument set in southwest side of the northwest end of State Route 630 bridge over the North Fork Powell River, river mile 1.60.
RM 28	34	1,409.48	Chiseled square on west end of north headwall of U. S. Route 58A bridge over the Powell River, river mile 166.93.
RM 29	34	1,409.42	Brass tablet in east end of north headwall of U. S. Route 58A bridge over the Powell River, river mile 166.93.
RM 30	37	1,461.08	Standard monument set in north end of headwall of State Route 708 bridge over Mud Creek, river mile 1.12.
RM 31	37	1,478.74	Top of white post on northeast side of driveway near Mud Creek, river mile 2.1, approximately 0.25 mile southwest along U. S. Route 58A from intersection with State Route 622.

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EXHIBIT 3 - ELEVATION REFERENCE MARKS

Reference Mark	FIRM Panel	Elevation (Feet NGVD)	Description of Location
RM 32	39	1,494.43	Nail in telegraph pole southwest of Southern Railway at North Fork Clinch River, river mile 26.0, approximately 0.5 mile southeast of intersection between Southern Railway and State Route 611.
RM 33	57	1,393.55	Standard monument set in southwest end of concrete curb on southeast side of U. S. Route 58A bridge over Cane Creek, river mile 3.10, approximately 225 feet southwest of intersection of U. S. Route 58A and State Route 643.
RM 34	57	1,453.64	Chiseled square on west wing wall at south end of State Route 644 bridge over Cane Creek, river mile 5.17.
RM 35	57	1,465.75	Chiseled square at northeast end of curb on northwest side of U. S. Route 58A bridge over Cane Creek, river mile 5.43.
RM 36	66	1,777.07	Top of extreme left bolt on east upstream guardrail on County Road at Dry Creek river mile 1.41.
RM 37	66	1,745.63	Standard monument set in east wing wall on north end of State Route 738 bridge over Dry Creek, river mile 1.20.

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EXHIBIT 3 - ELEVATION REFERENCE MARKS

Reference Mark	FIRM Panel	Elevation (Feet NGVD)	Description of Location
RM 38	66	1,744.58	Chiseled square in west wing wall on south end of State Route 738 bridge over Dry Creek, river mile 1.20.
RM 39	68	1,641.69	Chiseled square on northwest corner of upstream headwall of U. S. Route 58/421 bridge over Dry Creek, river mile 0.32.
RM 40	68	1,626.21	Chiseled square on south corner of southwest abutment 1 foot from guardrail on State Route 612 bridge over Dry Creek, river mile 0.17.
RM 41	68	1,597.41	Chiseled square in concrete retainer wall at end of fence on north bank of Wallen Creek, river mile 26.60.
RM 42	68	1,596.04	Standard monument set in north wing wall at west end of State Route 612 bridge No. 8361, approximately 0.3 mile west of Blue Spring Church, north of Wallen Creek, river mile 26.45.
RM 43	78	1,318.72	Standard monument set in east end of curb on south side of U. S. Route 58 bridge over Indian Creek, river mile 17.27.
RM 44	78	1,339.15	Standard monument set in east end of curb on south side of U. S. Route 58 bridge over Indian Creek, river mile 18.98, along State Route 684.

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EXHIBIT 3 - ELEVATION REFERENCE MARKS

Reference Mark	FIRM Panel	Elevation (Feet NGVD)	Description of Location
RM 45	78	1,341.90	Nail in power pole No. 8857 approximately 240 feet northeast of intersection of State Route 690 and State Route 684, Indian Creek, river mile 19.44, along State Route 684.
RM 46	78	1,340.34	Standard monument set in north corner of east headwall of State Route 690 bridge over Indian Creek, river mile 20.07.
RM 47	78	1,359.50	Standard monument set in north corner of east abutment of State Route 698 bridge over Indian Creek, river mile 21.97.
RM 48	79	1,373.64	Standard monument set in east corner of south bank abutment of State Route 687 bridge over Indian Creek, river mile 22.90.
RM 49	79	1,379.85	Standard monument set in west corner of south abutment of State Route 684 bridge over Indian Creek, river mile 23.98.
RM 50	79	1,391.03	Standard monument set in west corner of north abutment of State Route 724 bridge over Indian Creek, river mile 25.03.

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EXHIBIT 3 - ELEVATION REFERENCE MARKS

Reference Mark	FIRM Panel	Elevation (Feet NGVD)	Description of Location
RM 51	82	1,401.18	Chiseled square on northwest corner of abutment at northeast end of U. S. Route 58 bridge over Poor Valley Branch, river mile 0.26.
RM 52	82	1,395.53	Bolt head on north end of east curb on State Route 672 bridge over Poor Valley Branch, river mile 0.02.
RM 53	82	1,407.97	Standard monument set in east end of south headwall of U. S. Route 58 bridge over Martin Creek, river mile 9.02.

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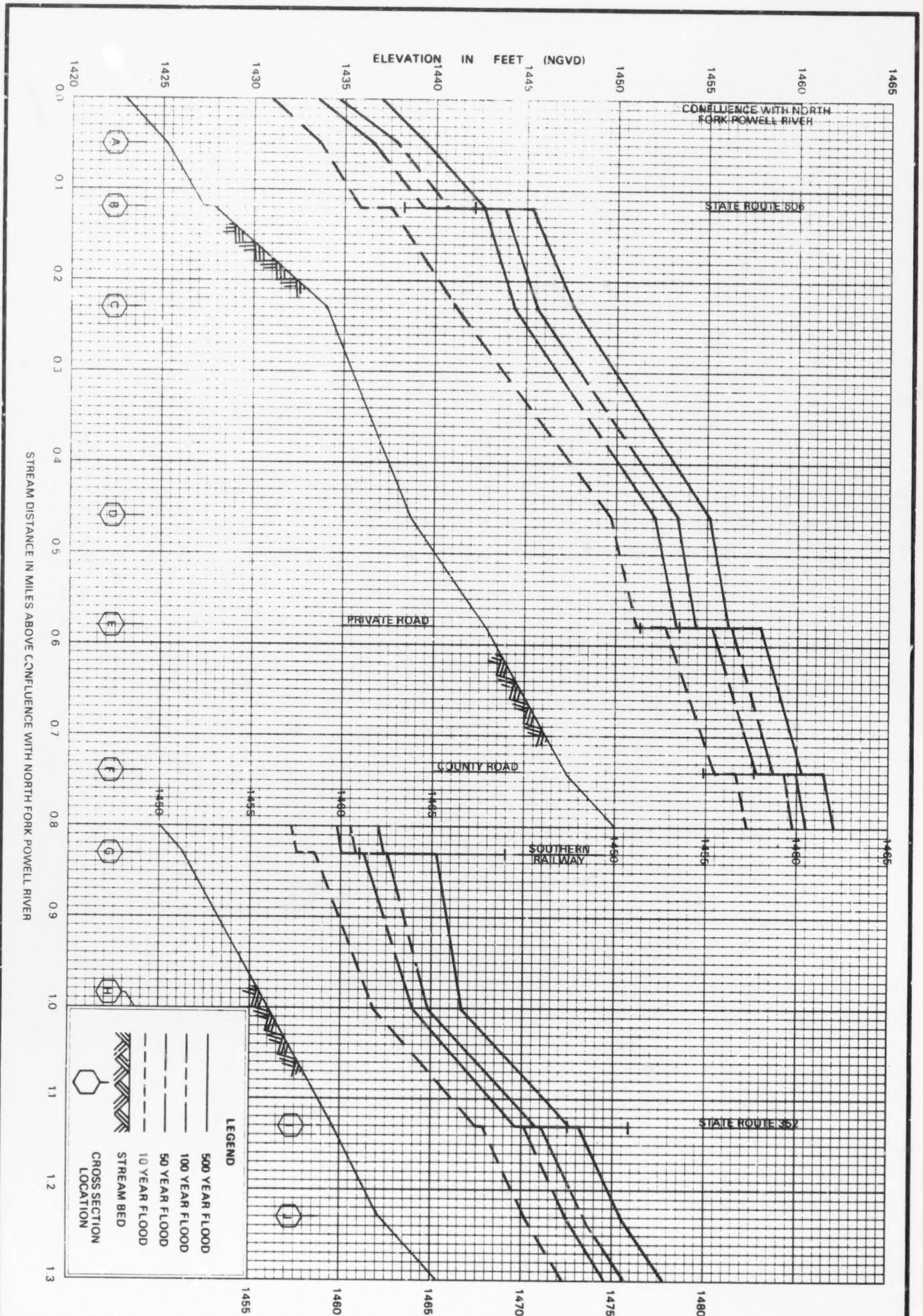

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

FLOOD PROFILES

STRAIGHT CREEK

01P

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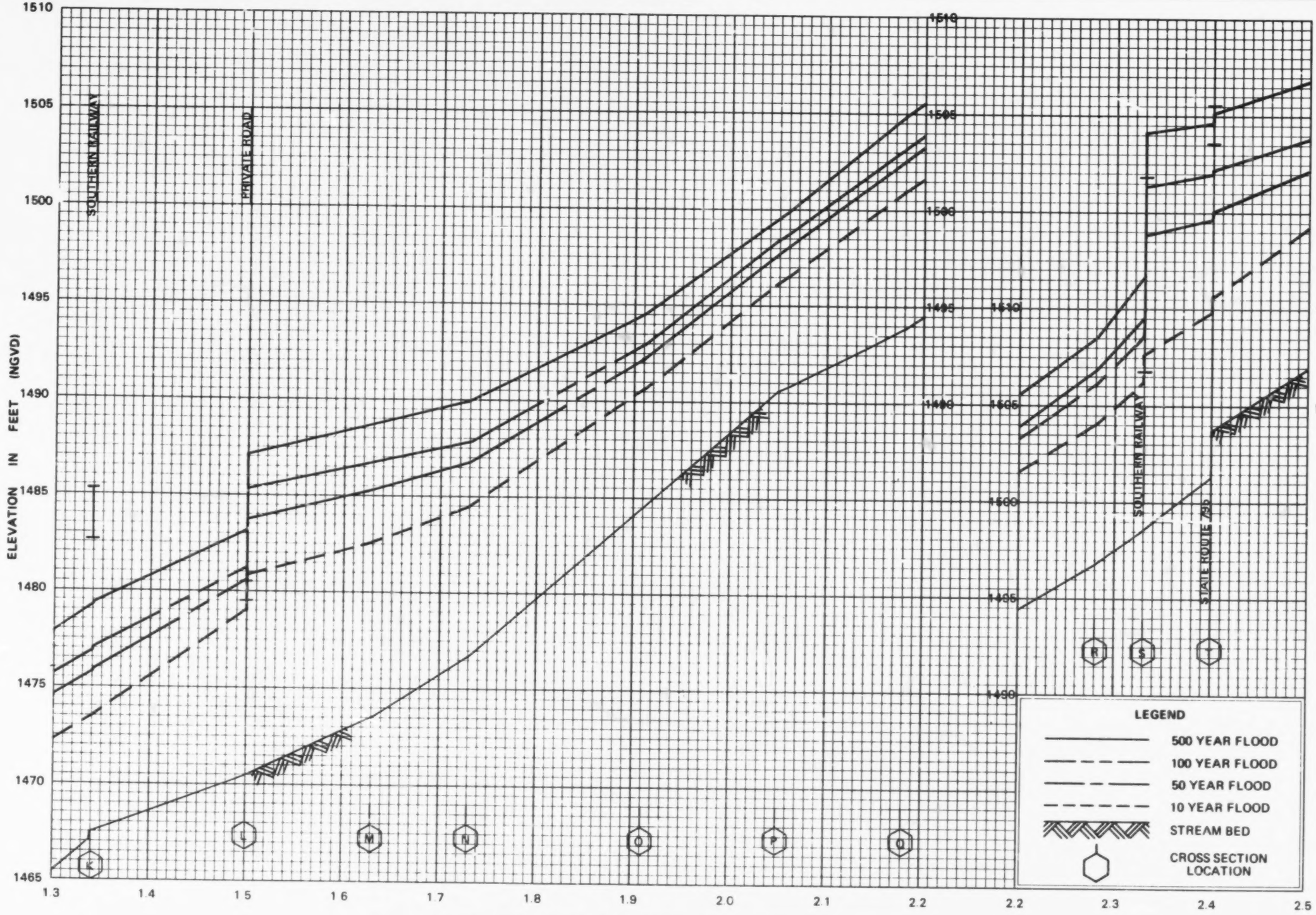

FLOOD PROFILES

STRAIGHT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

02P

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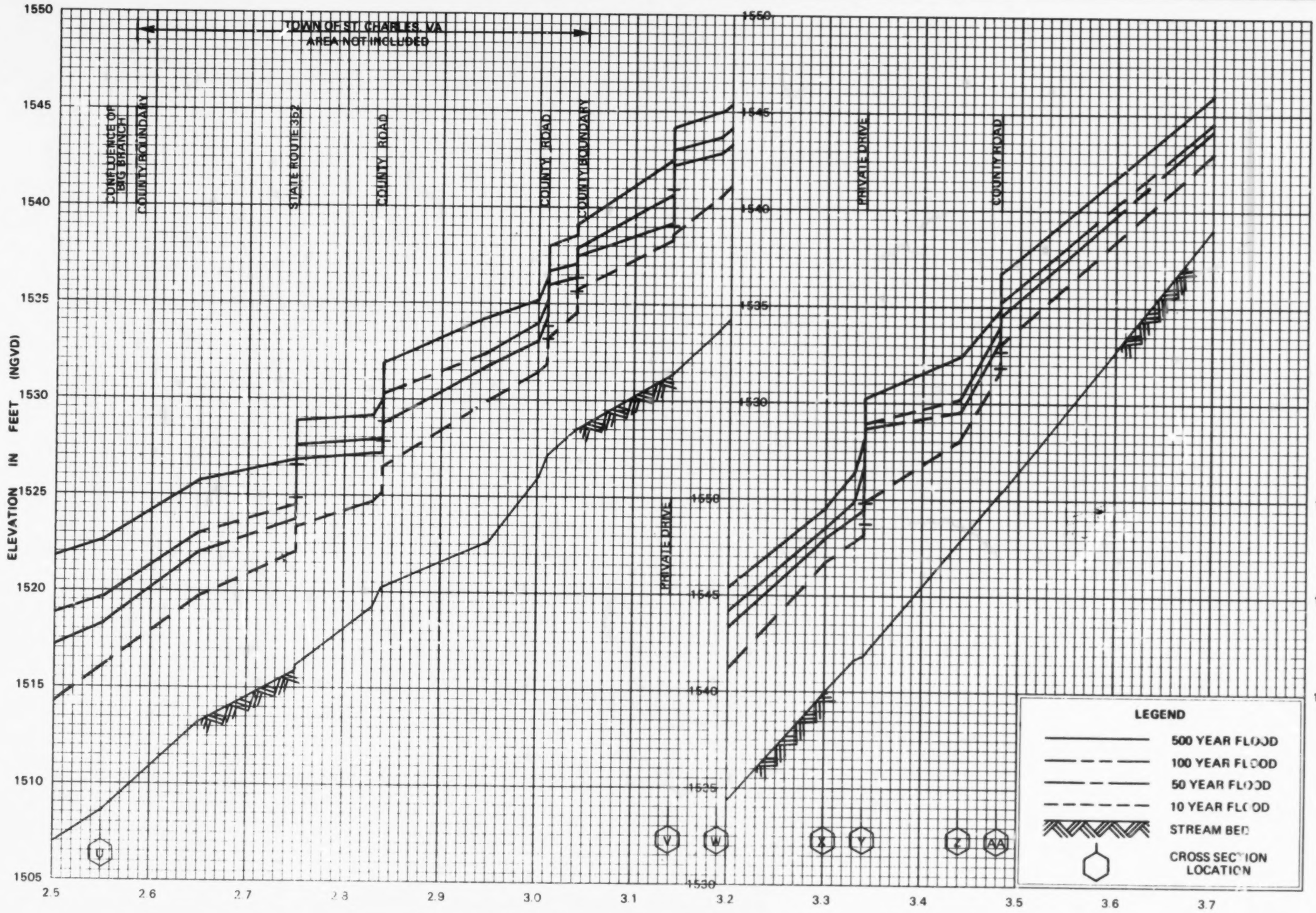

FLOOD PROFILES

STRAIGHT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

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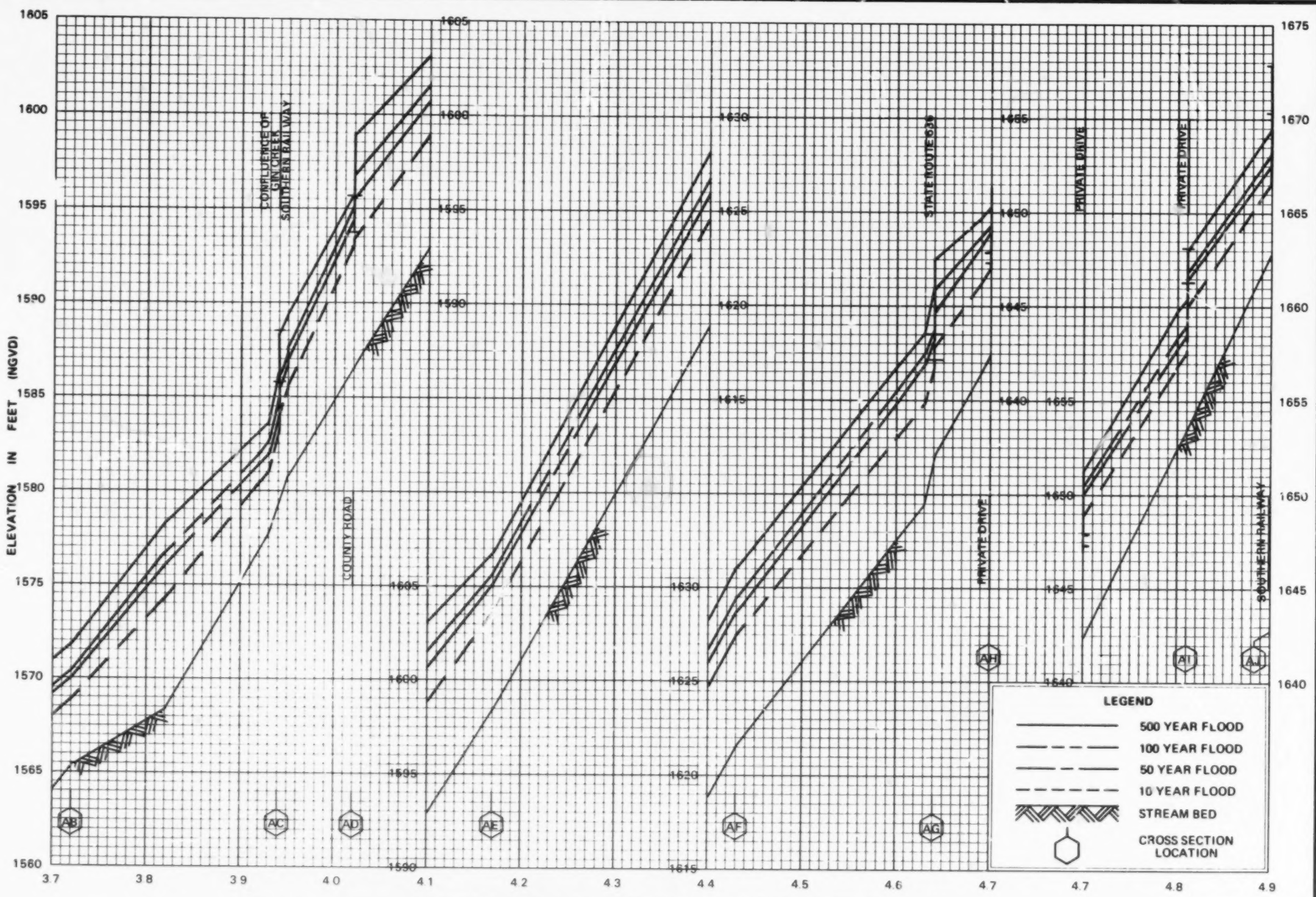

FLOOD PROFILES

STRAIGHT CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

04P

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FLOOD PROFILES

STRAIGHT CREEK

FEDERAL EMERGENCY MANAGEMENT ACENCY

LEE COUNTY, VA

(UNINCORPORATED AREAS)

05P

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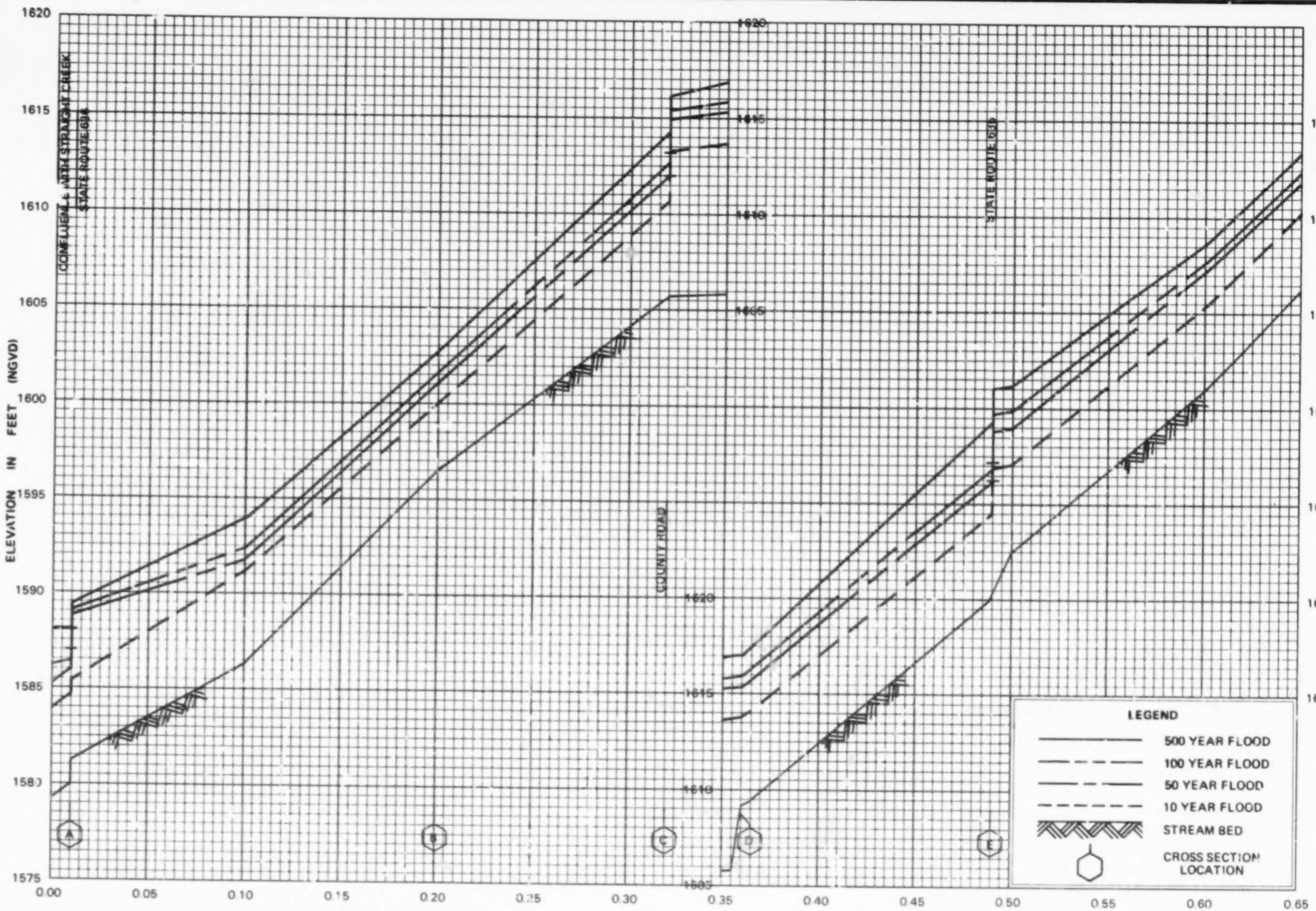

FLOOD PROFILES

GIN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

05P

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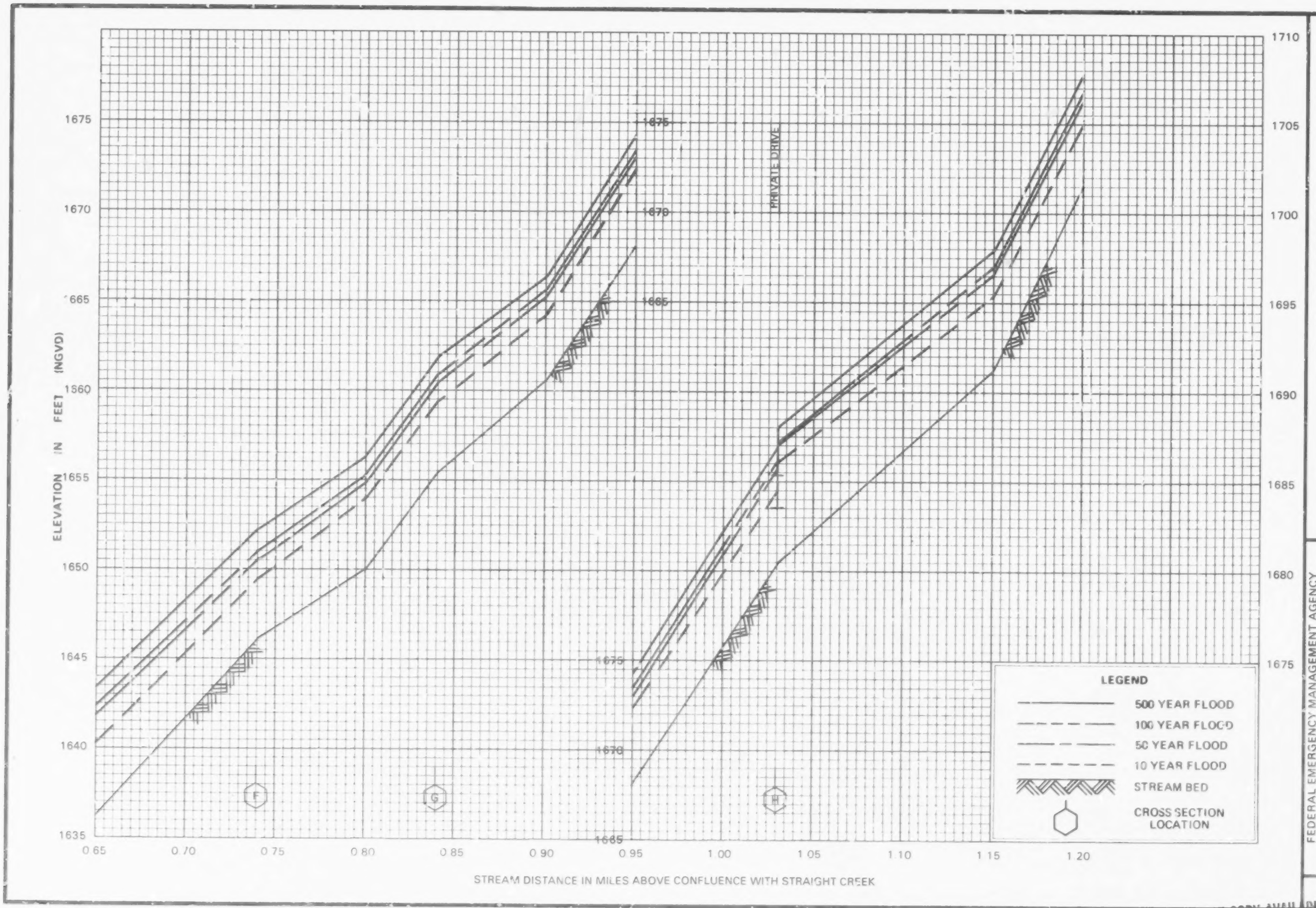

FLOOD PROFILES

GIN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

07P

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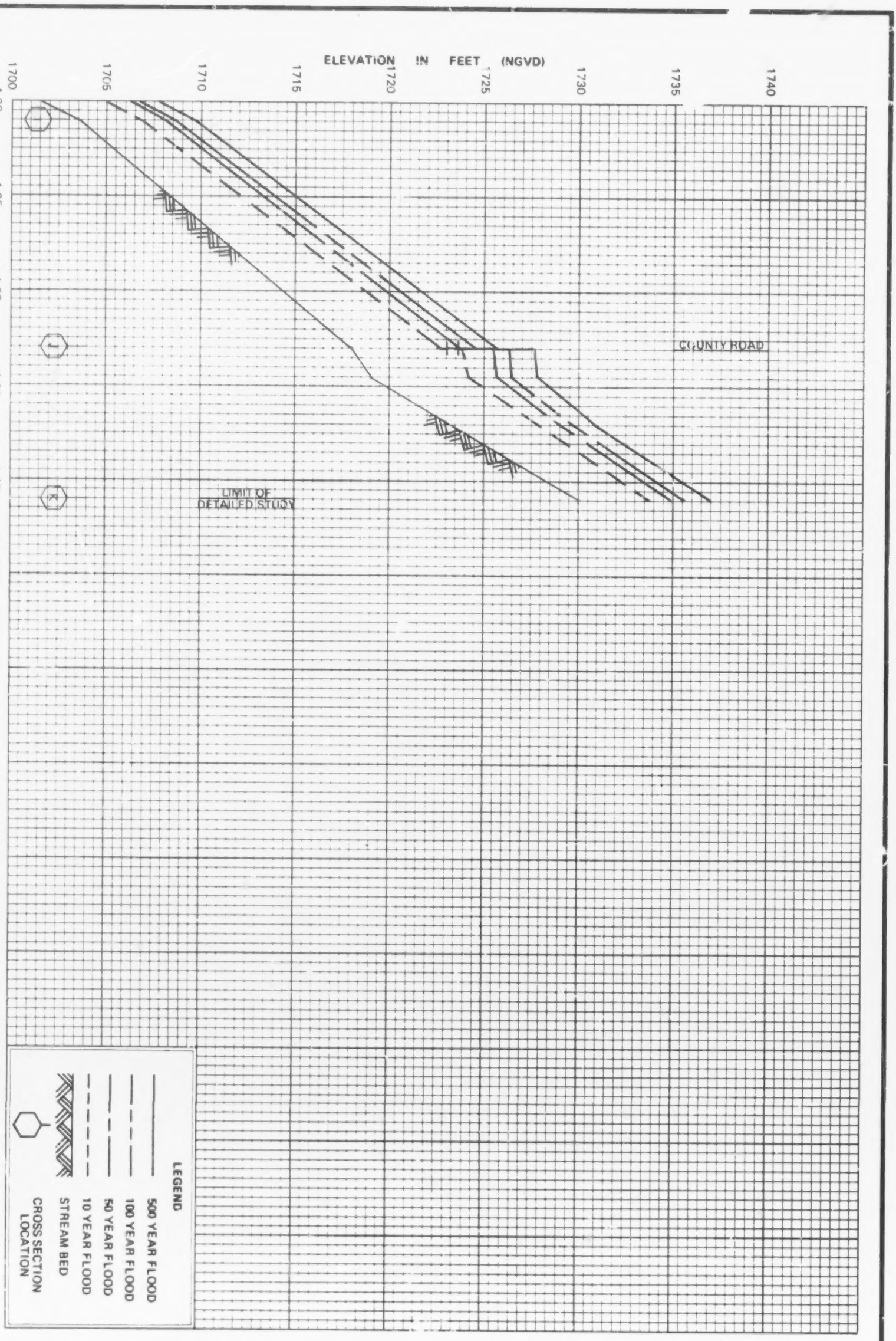

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

FLOOD PROFILES

GIN CREEK

08P

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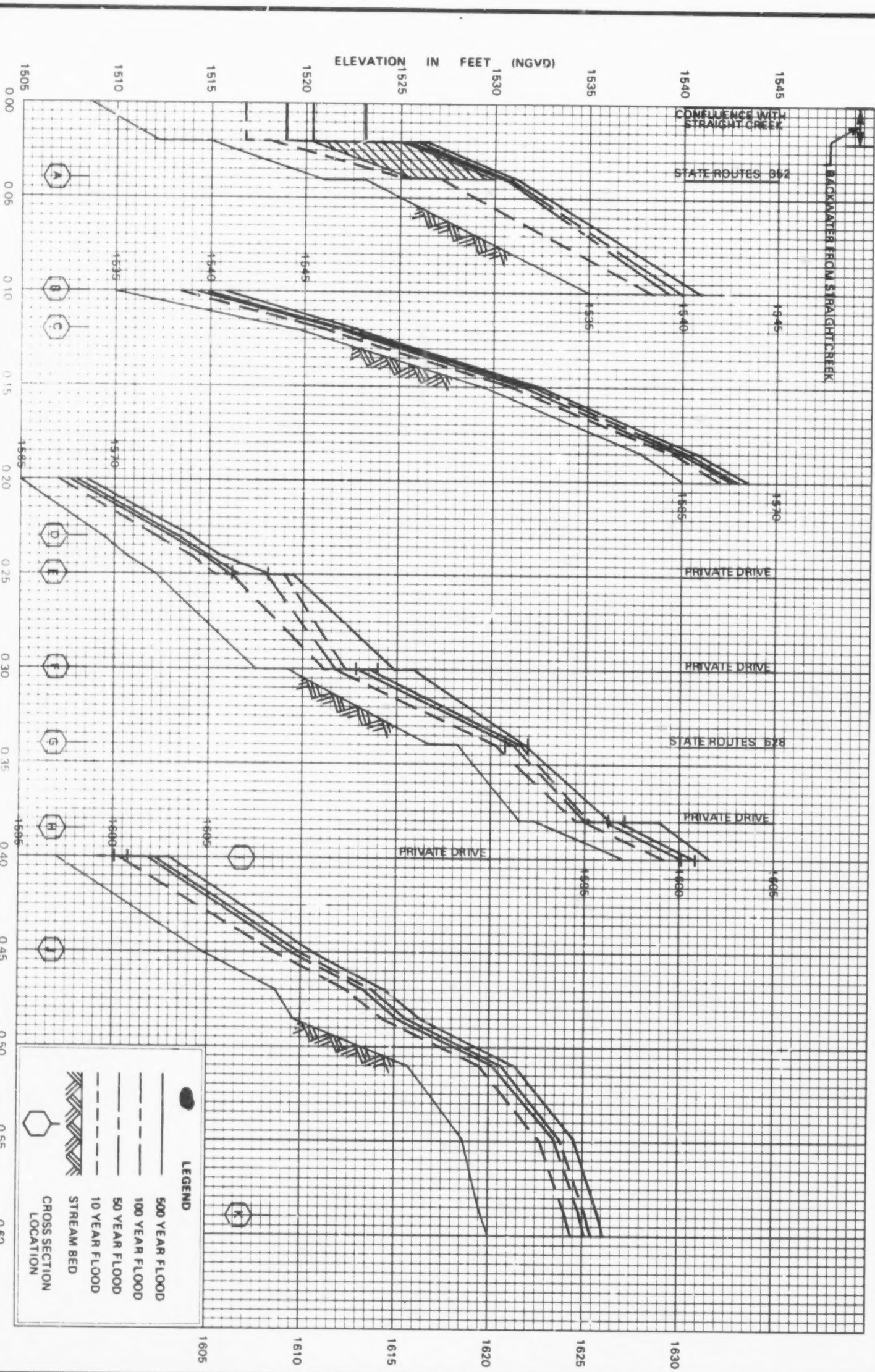

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

FLOOD PROFILES

BIG BRANCH

09P

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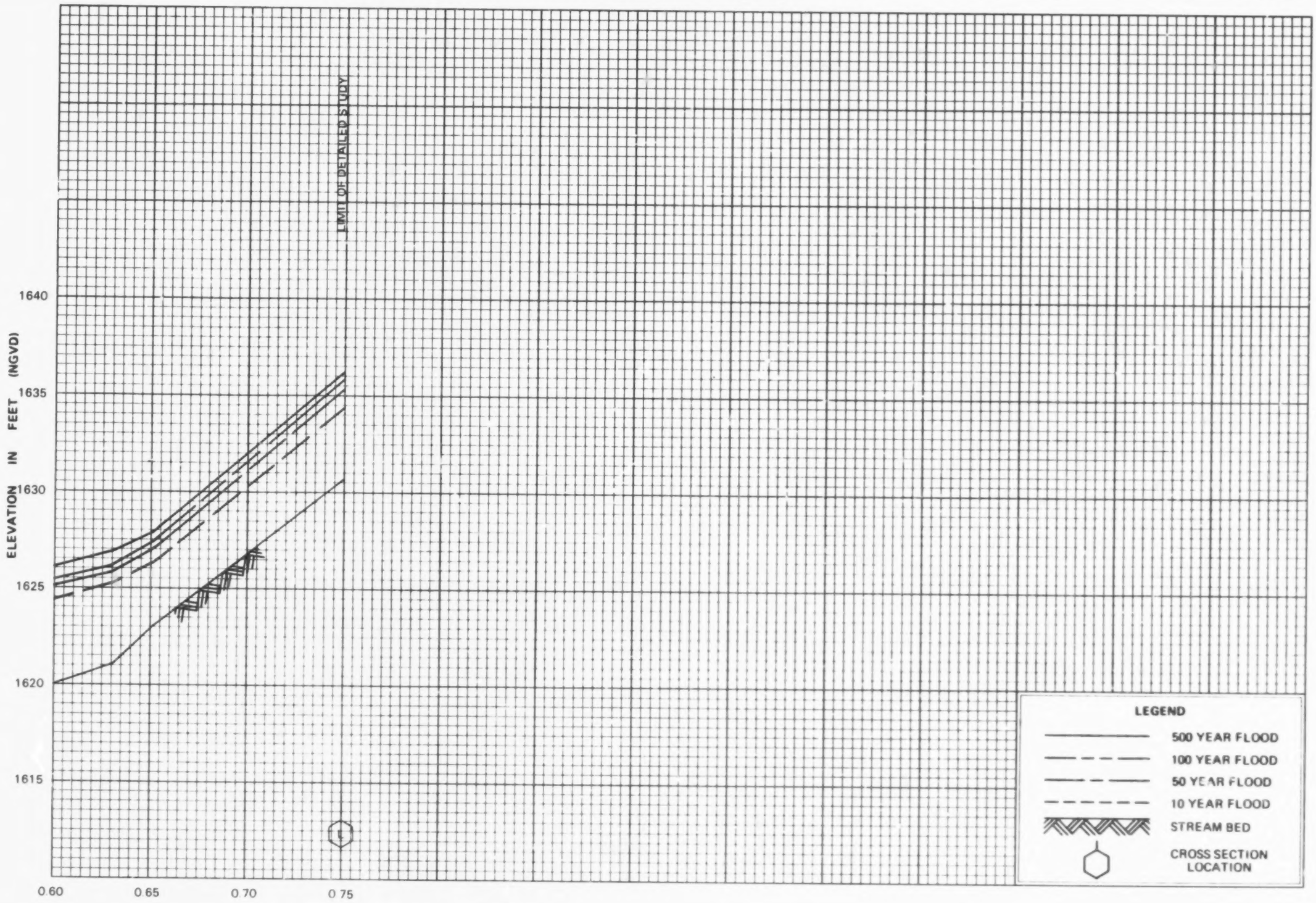

FLOOD PROFILES

BIG BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

10P

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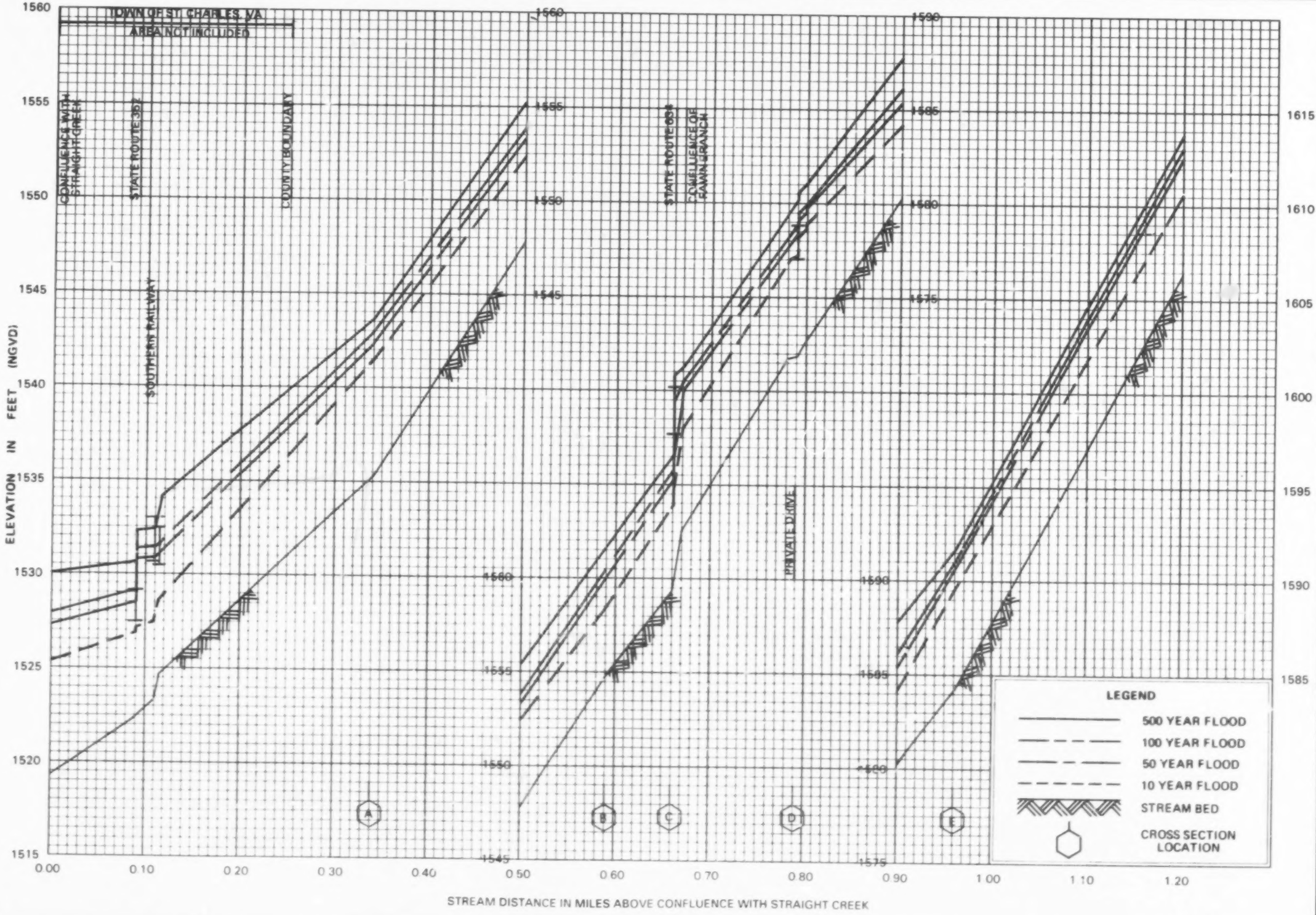


FLOOD PROFILES

BAILEYS TRACE

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

11P

BEST COPY AVAILABLE

FLOOD PROFILES

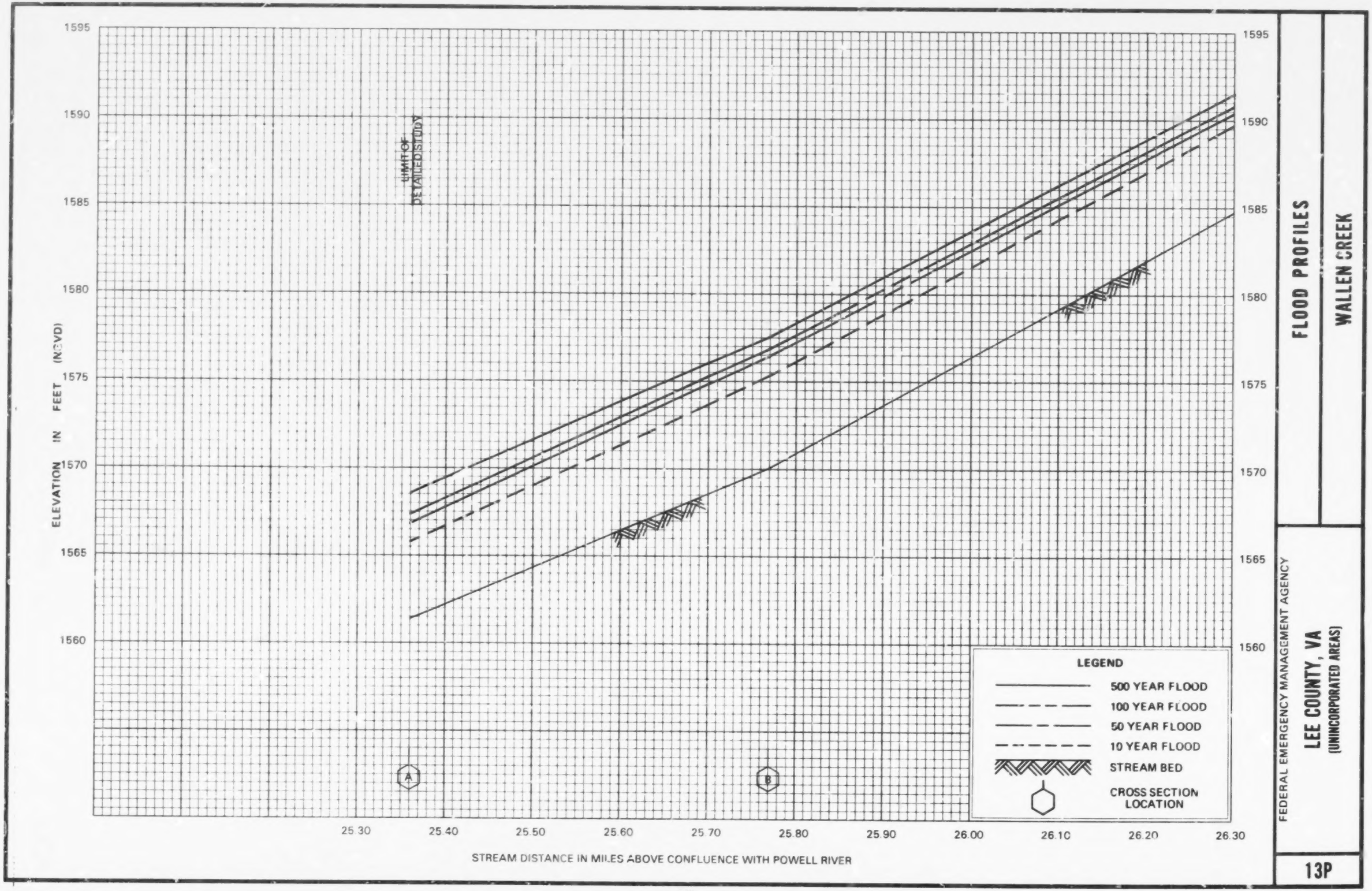
BAILEYS TRACE

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

12P

BEST COPY AVAILABLE



FLOOD PROFILES

WALLEN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

13P

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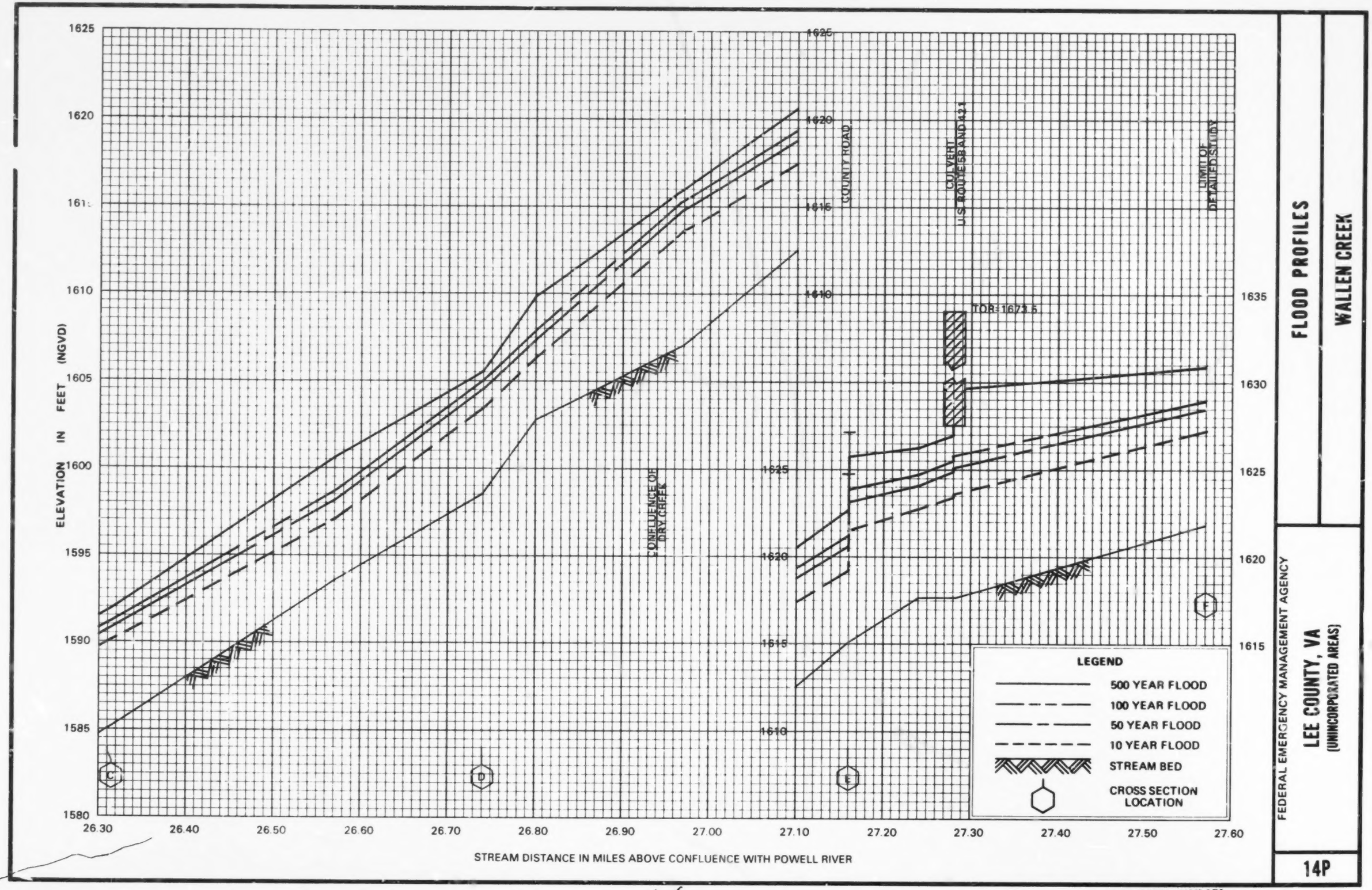

FLOOD PROFILES

WALLEN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

14P

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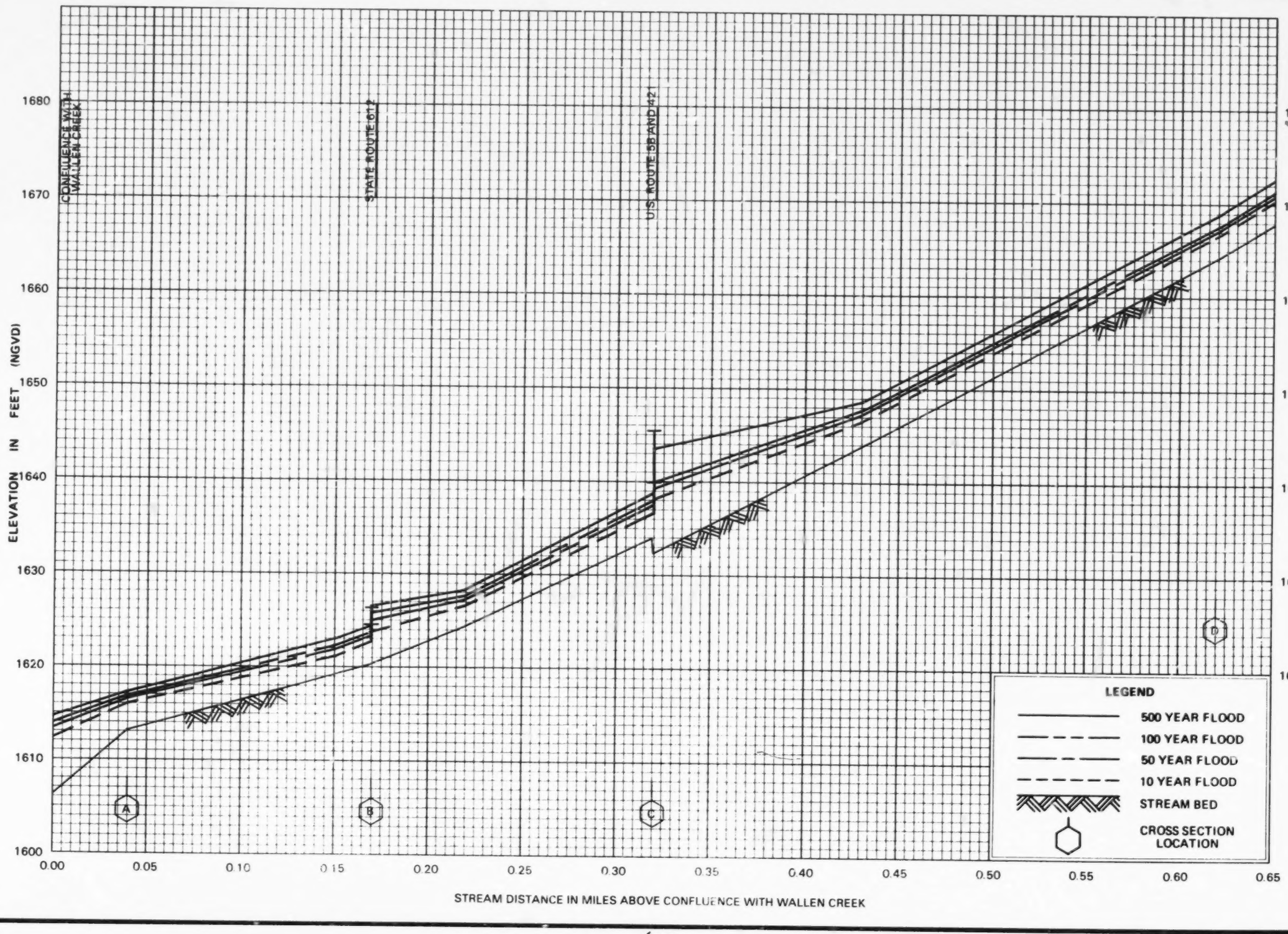


FLOOD PROFILES

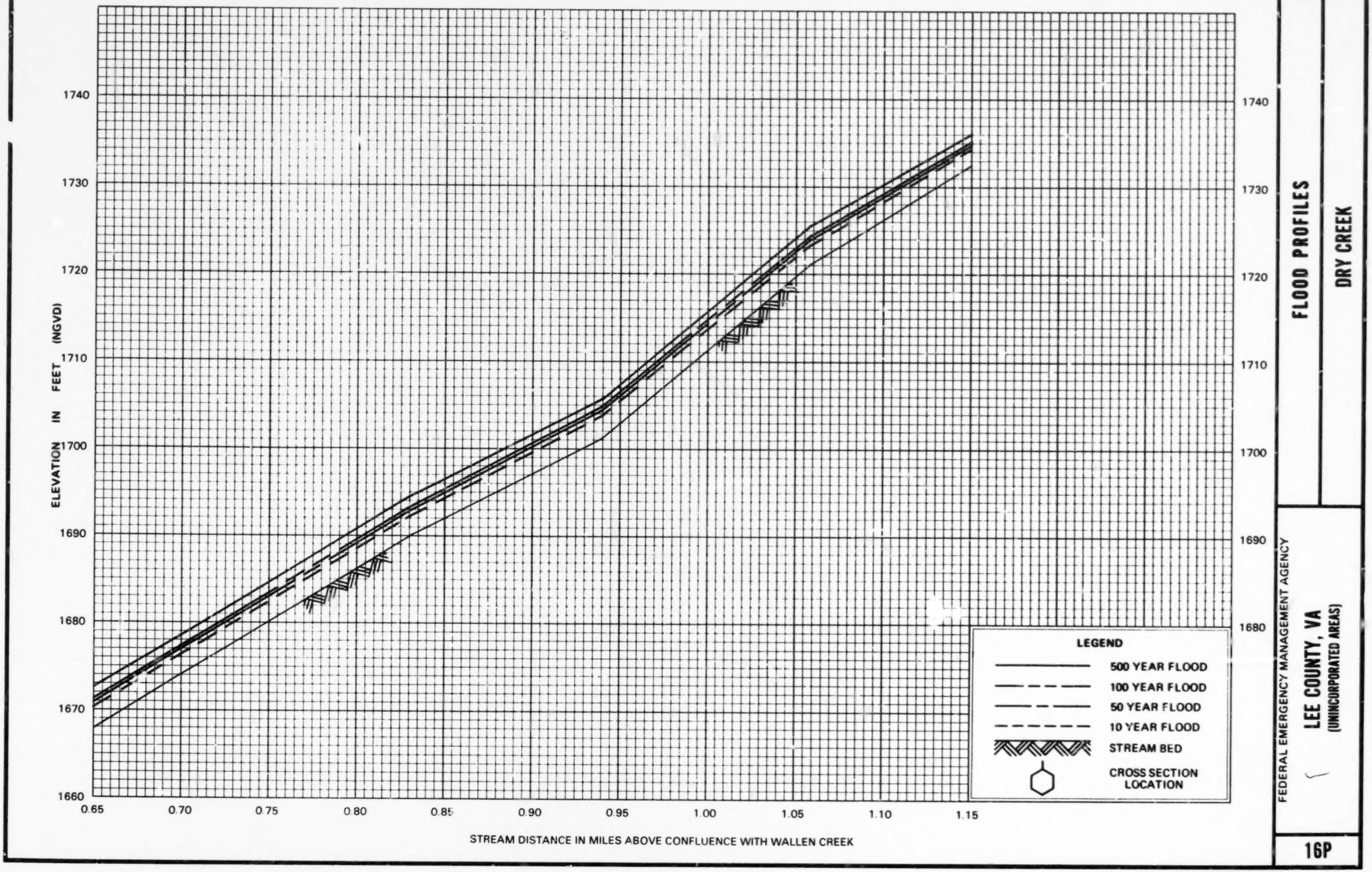
DRY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

15P

BEST COPY AVAILABLE



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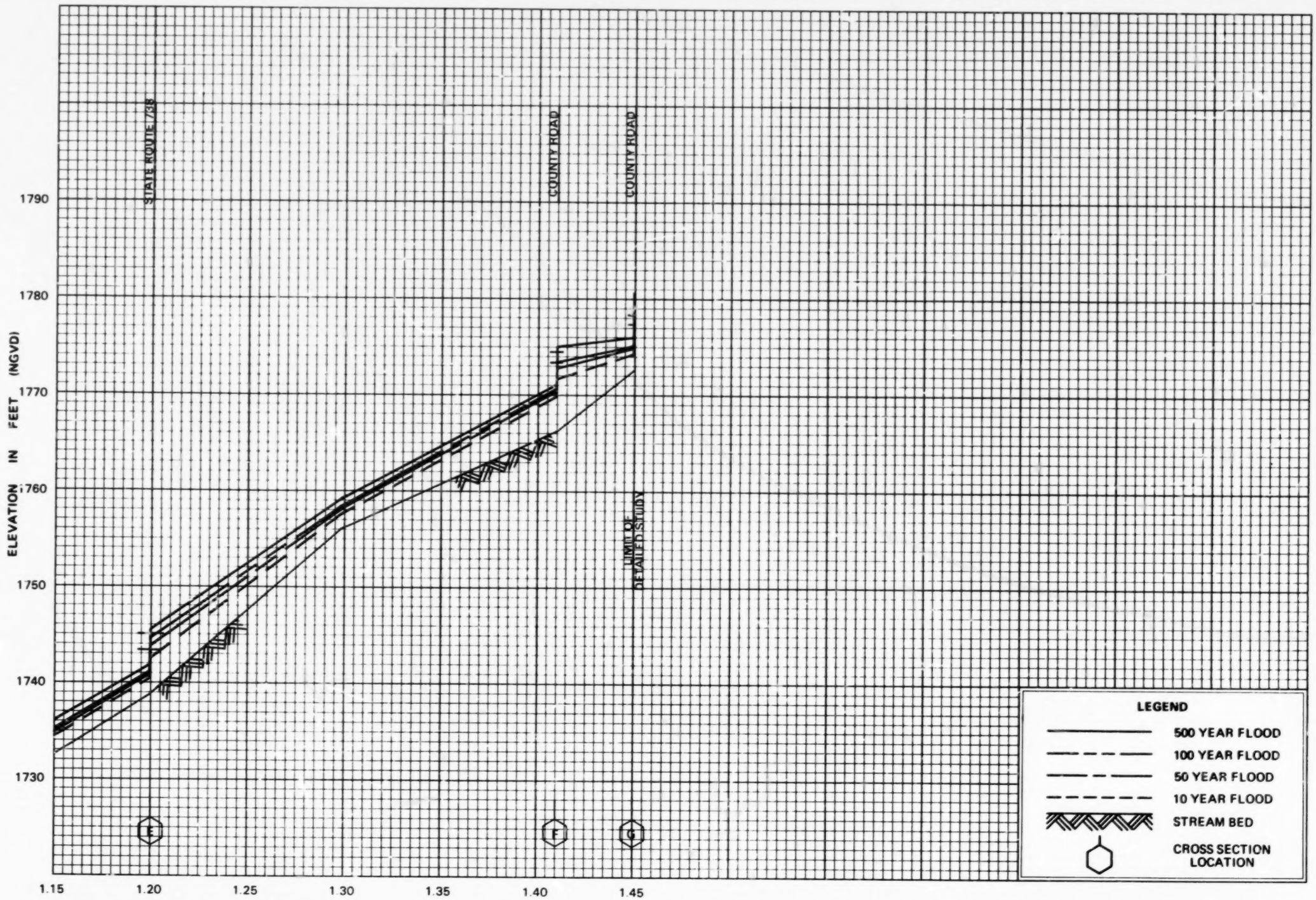


FLOOD PROFILES

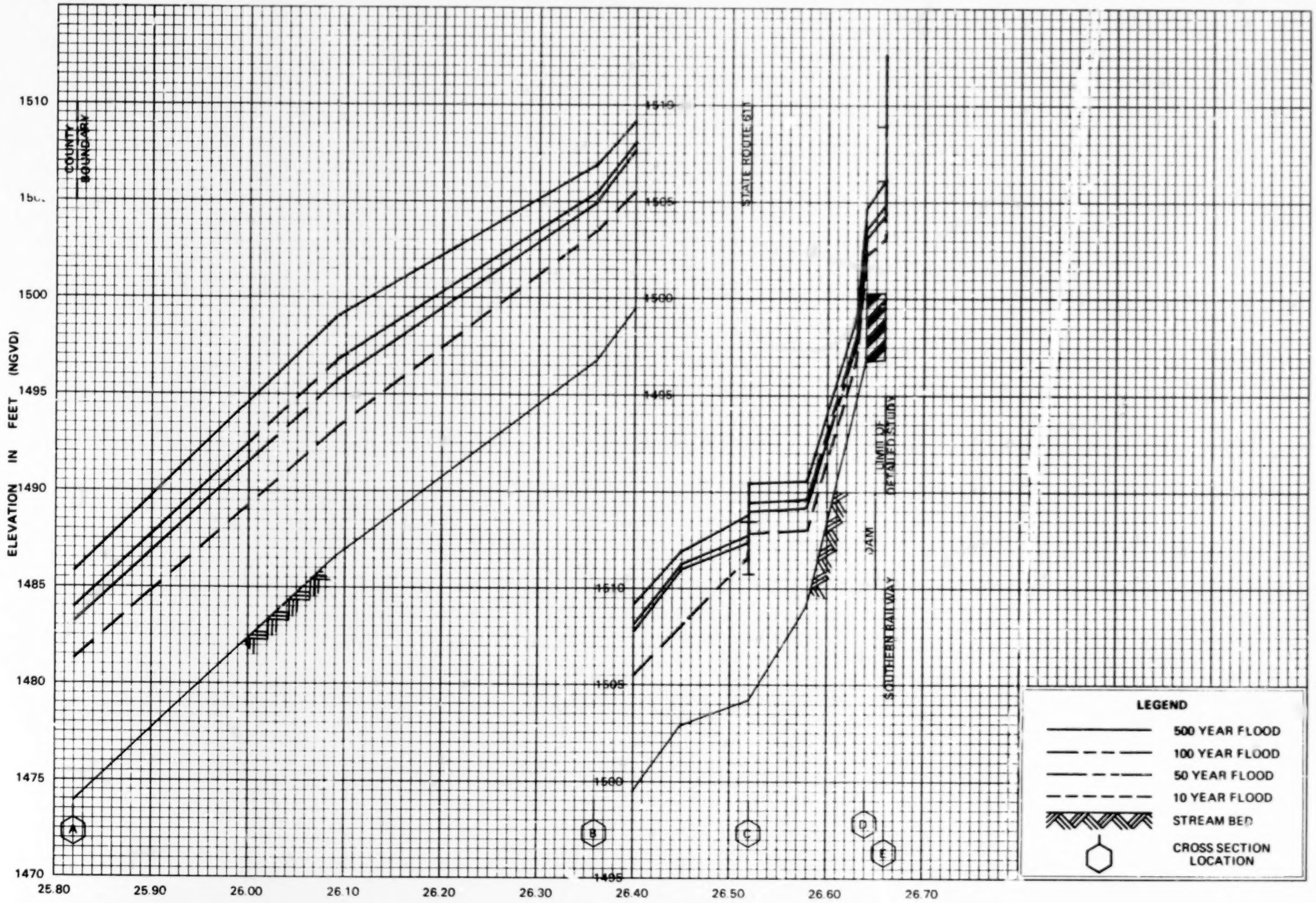
DRY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

17P

BEST COPY AVAILABLE



FLOOD PROFILES

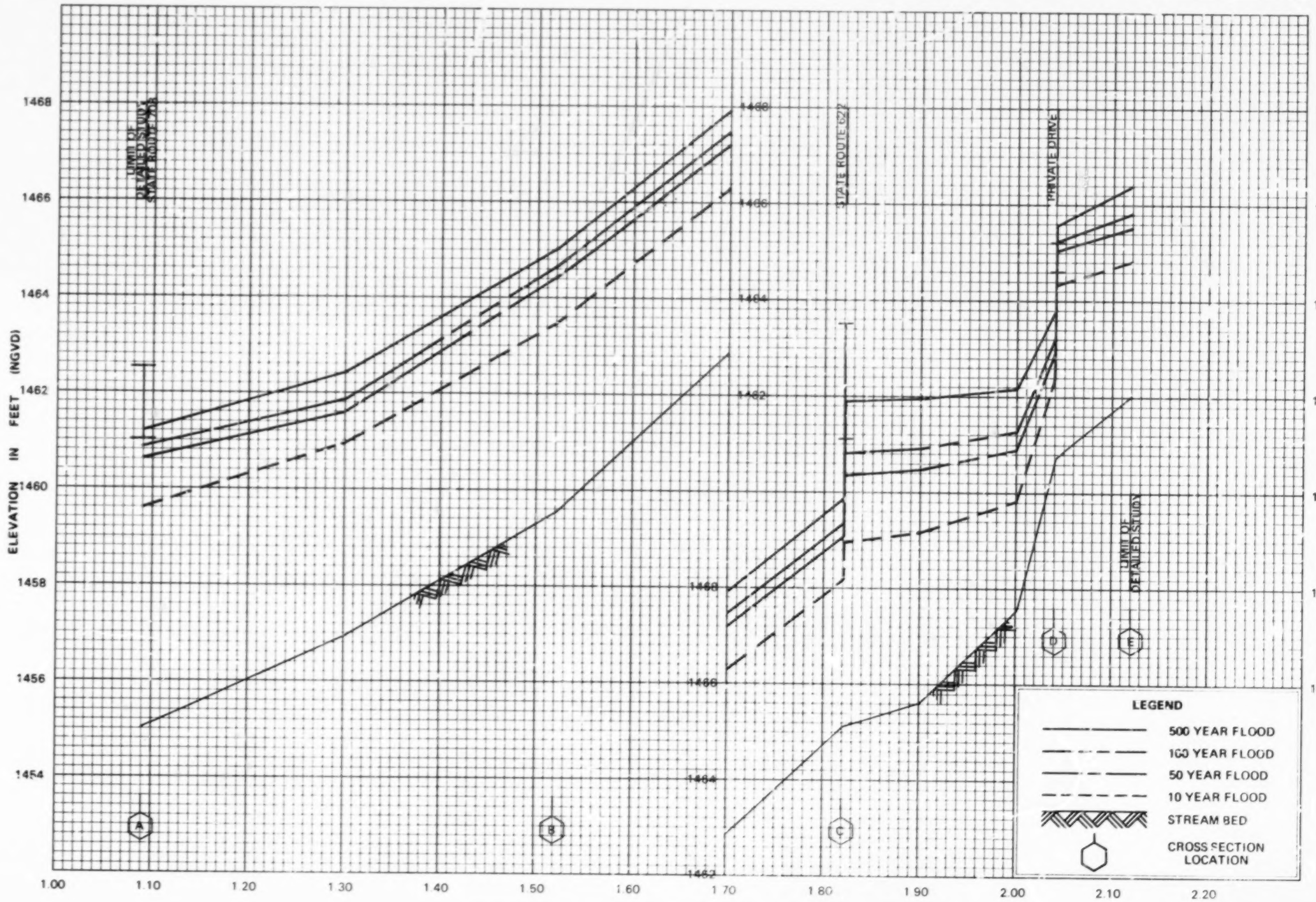
NORTH FORK CLINCH RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

18P

BEST COPY AVAILABLE



FLOOD PROFILES

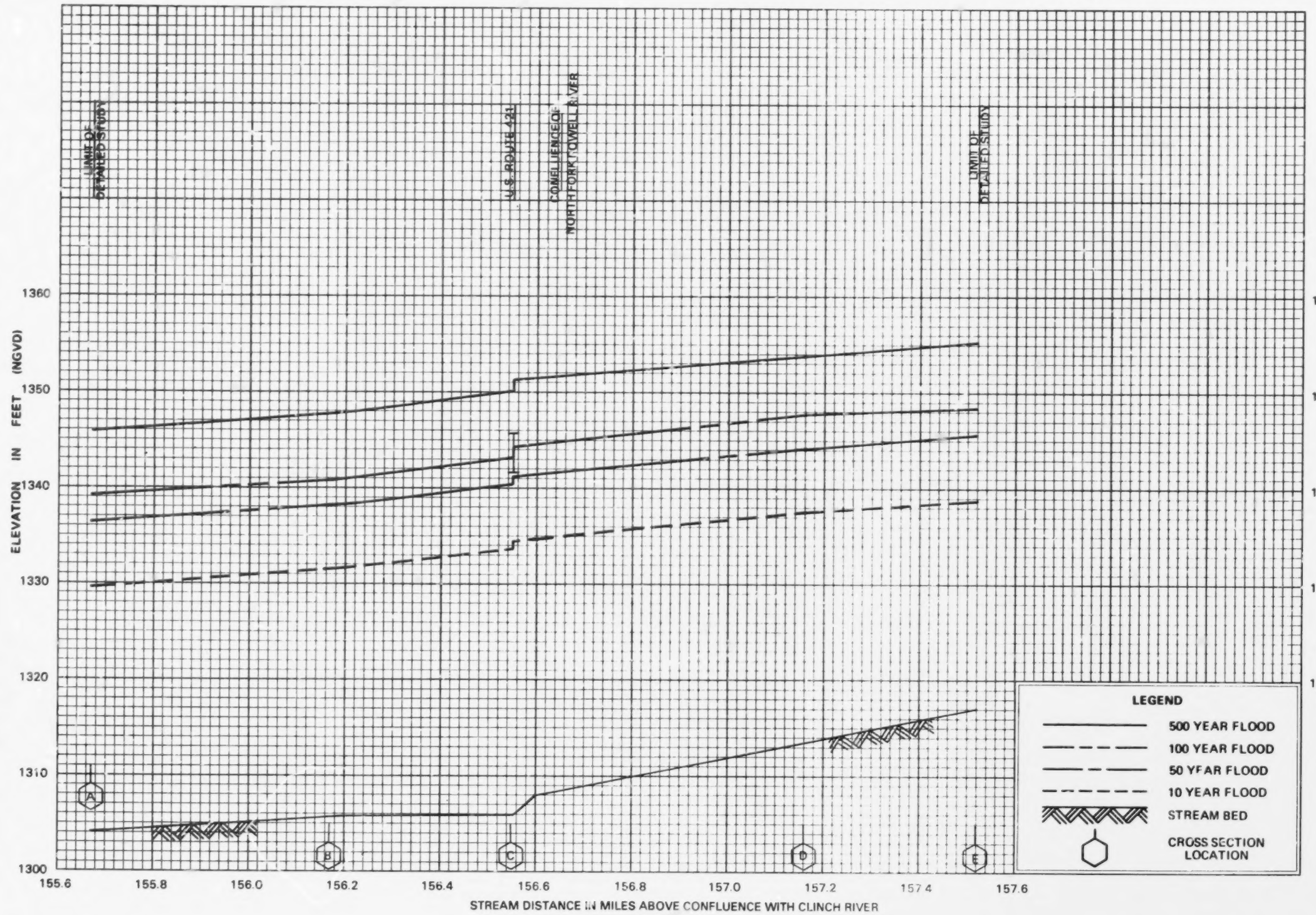
MUD CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

19P

BEST COPY AVAILABLE



FLOOD PROFILES

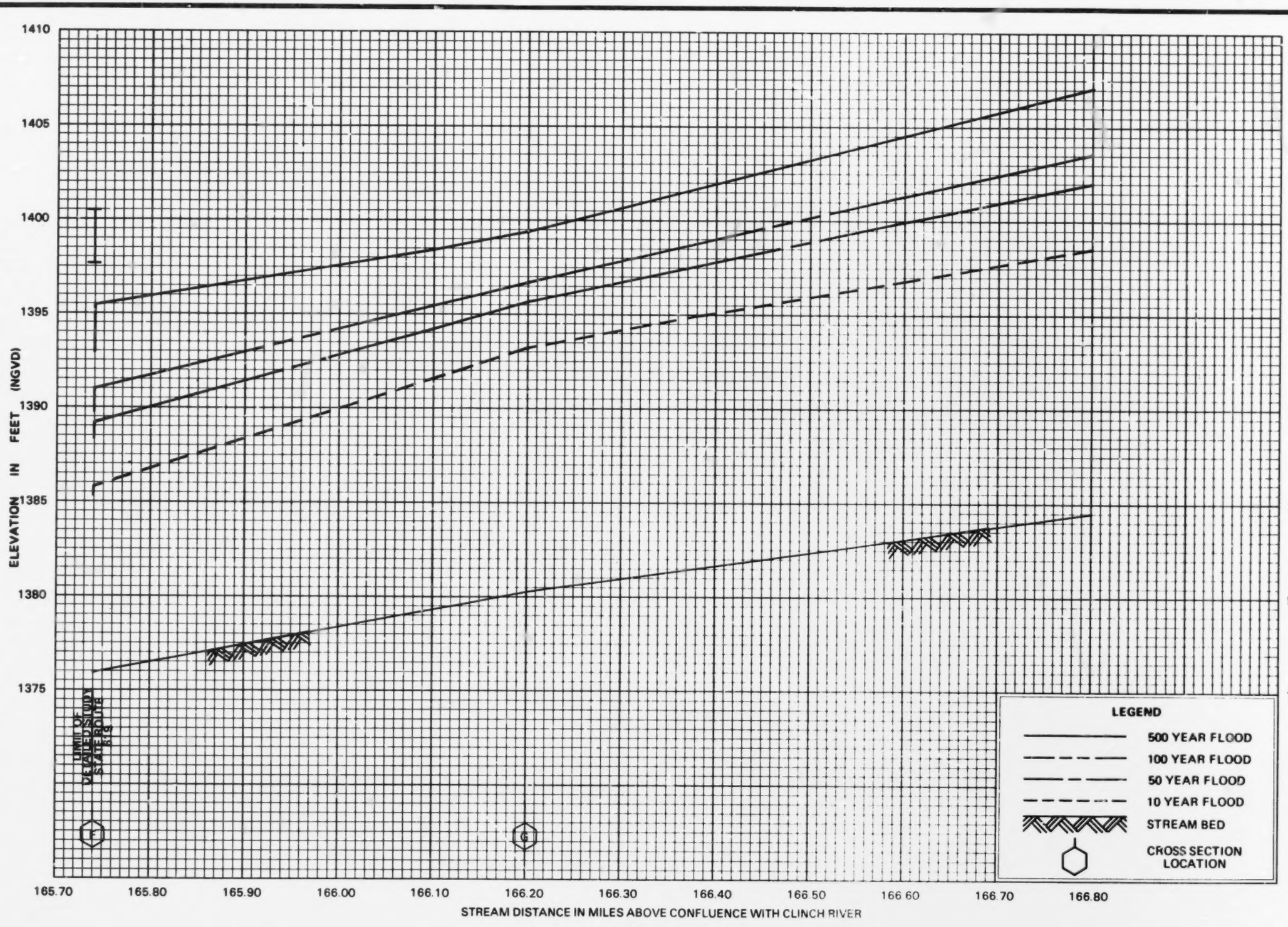
POWELL RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

20P

BEST COPY AVAILABLE



FLOOD PROFILES

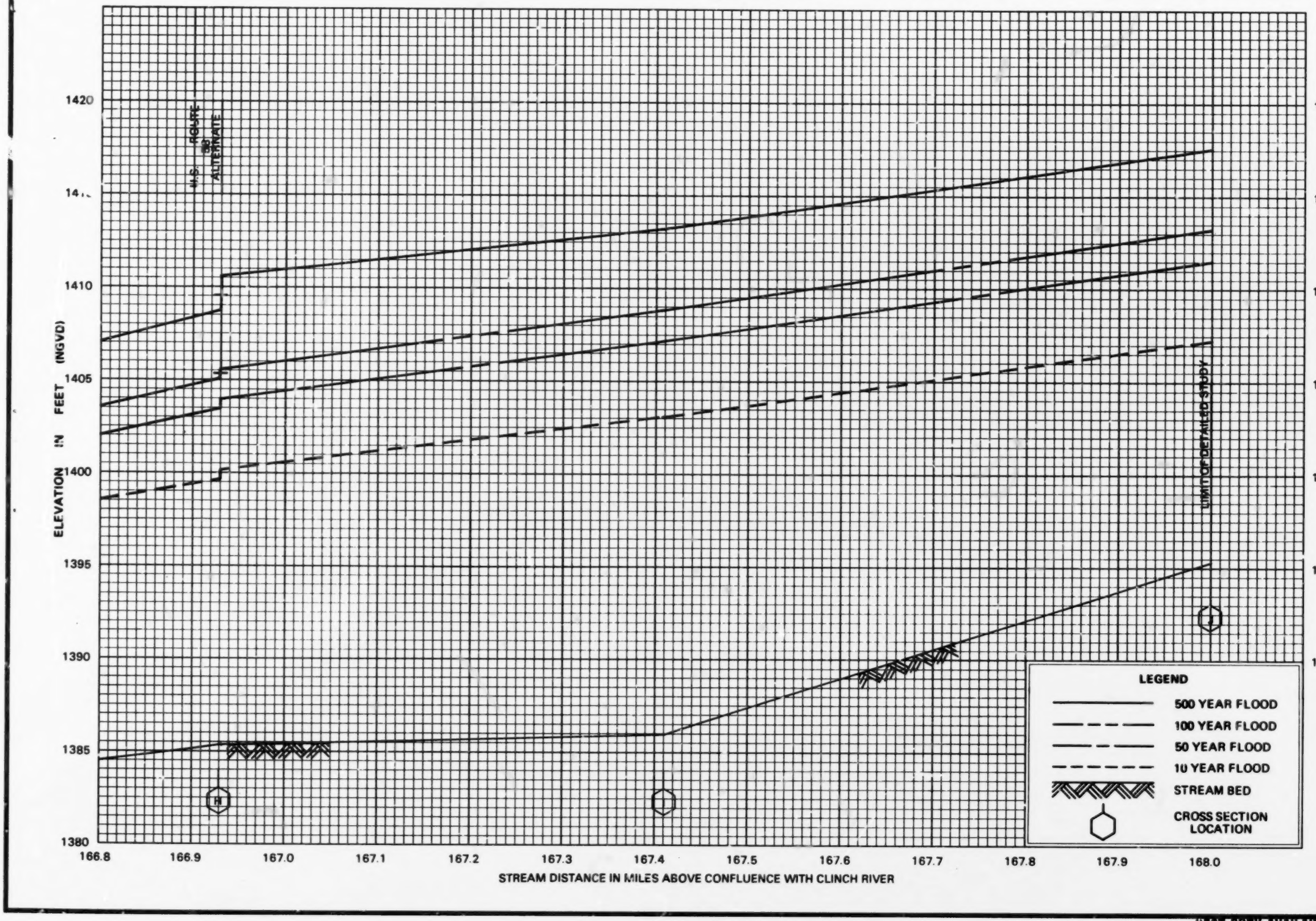
POWELL RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

21P

BEST COPY AVAILABLE



FLOOD PROFILES

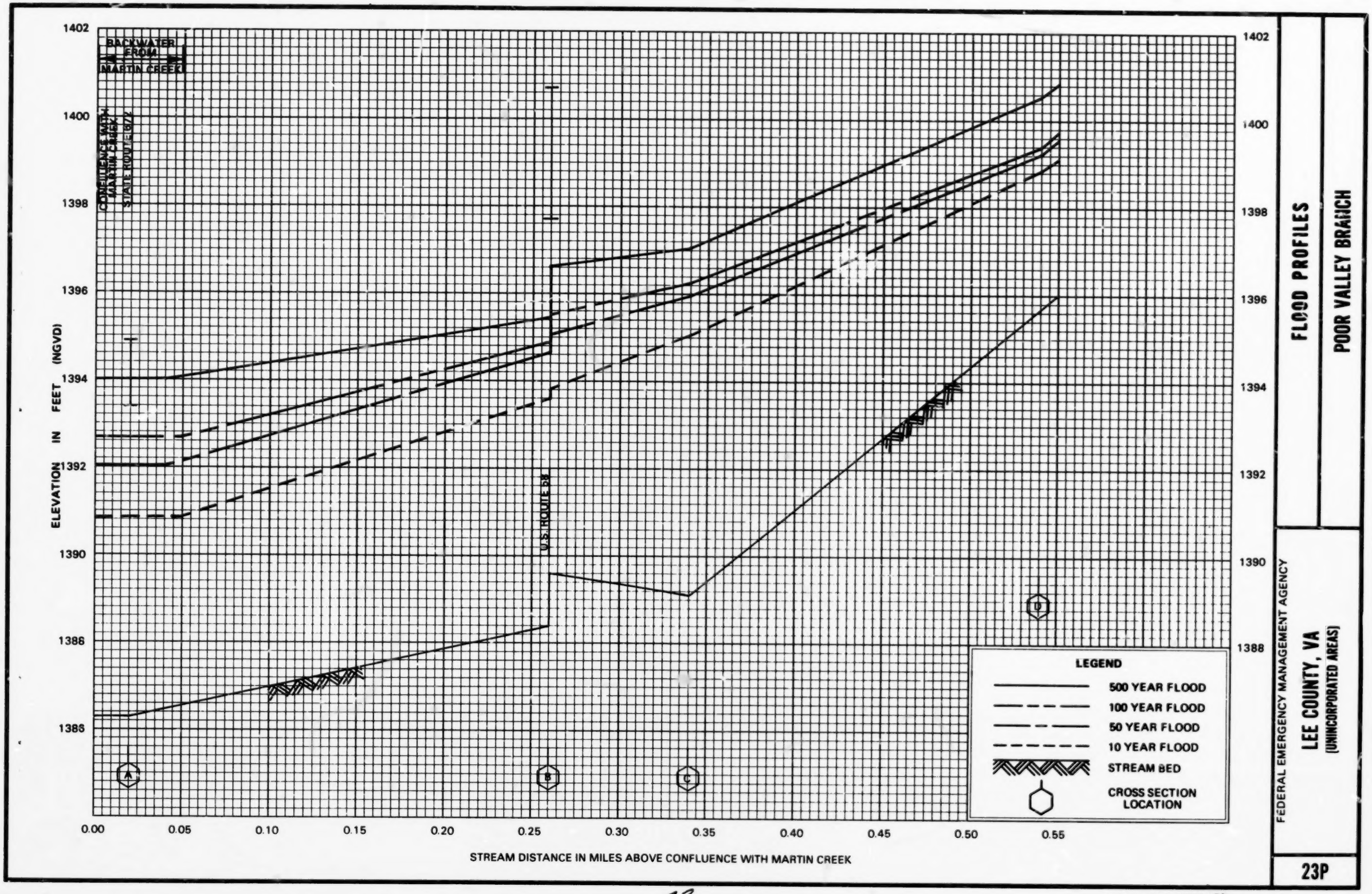
POWELL RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

22P

BEST COPY AVAILABLE



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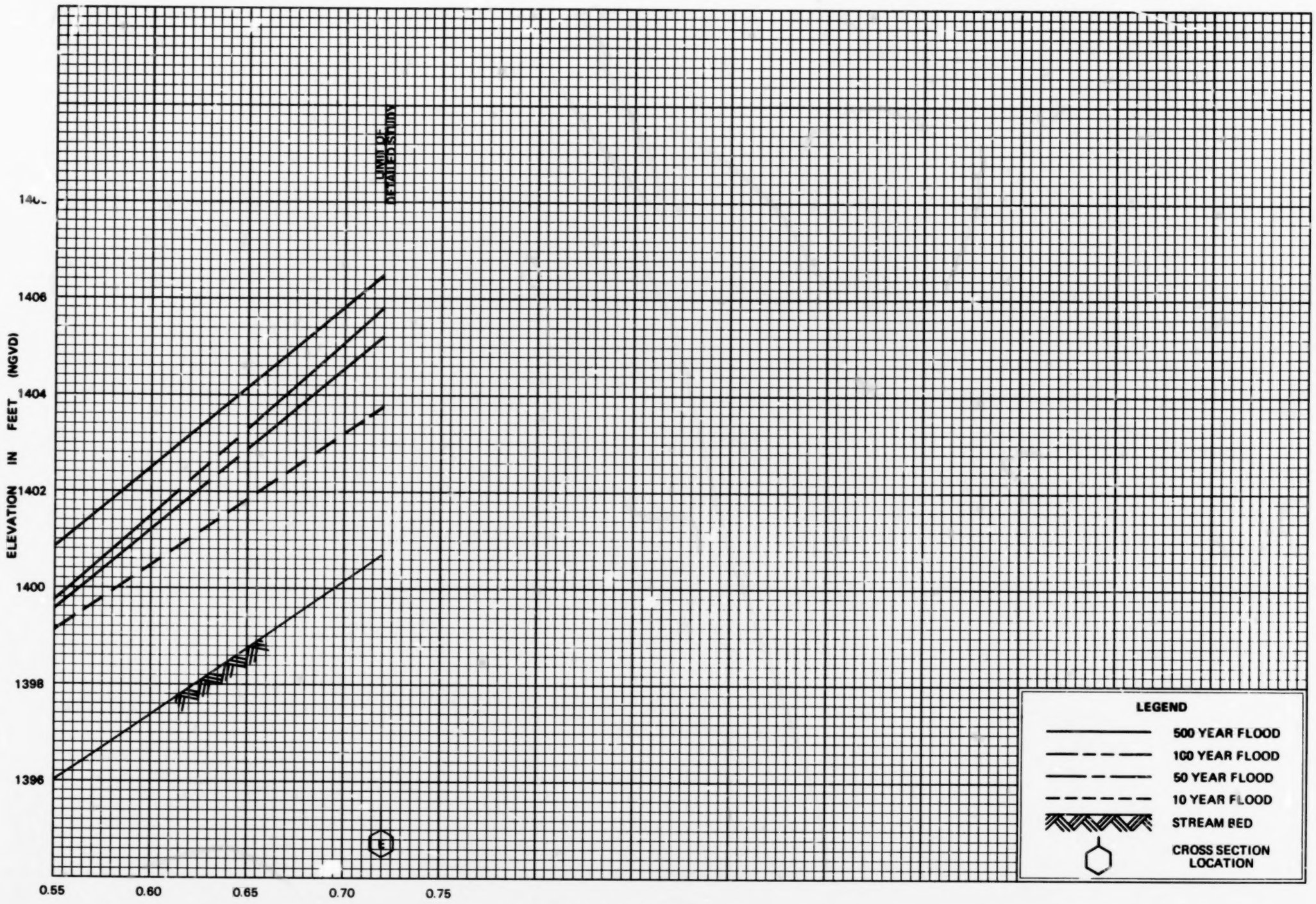


FLOOD PROFILES

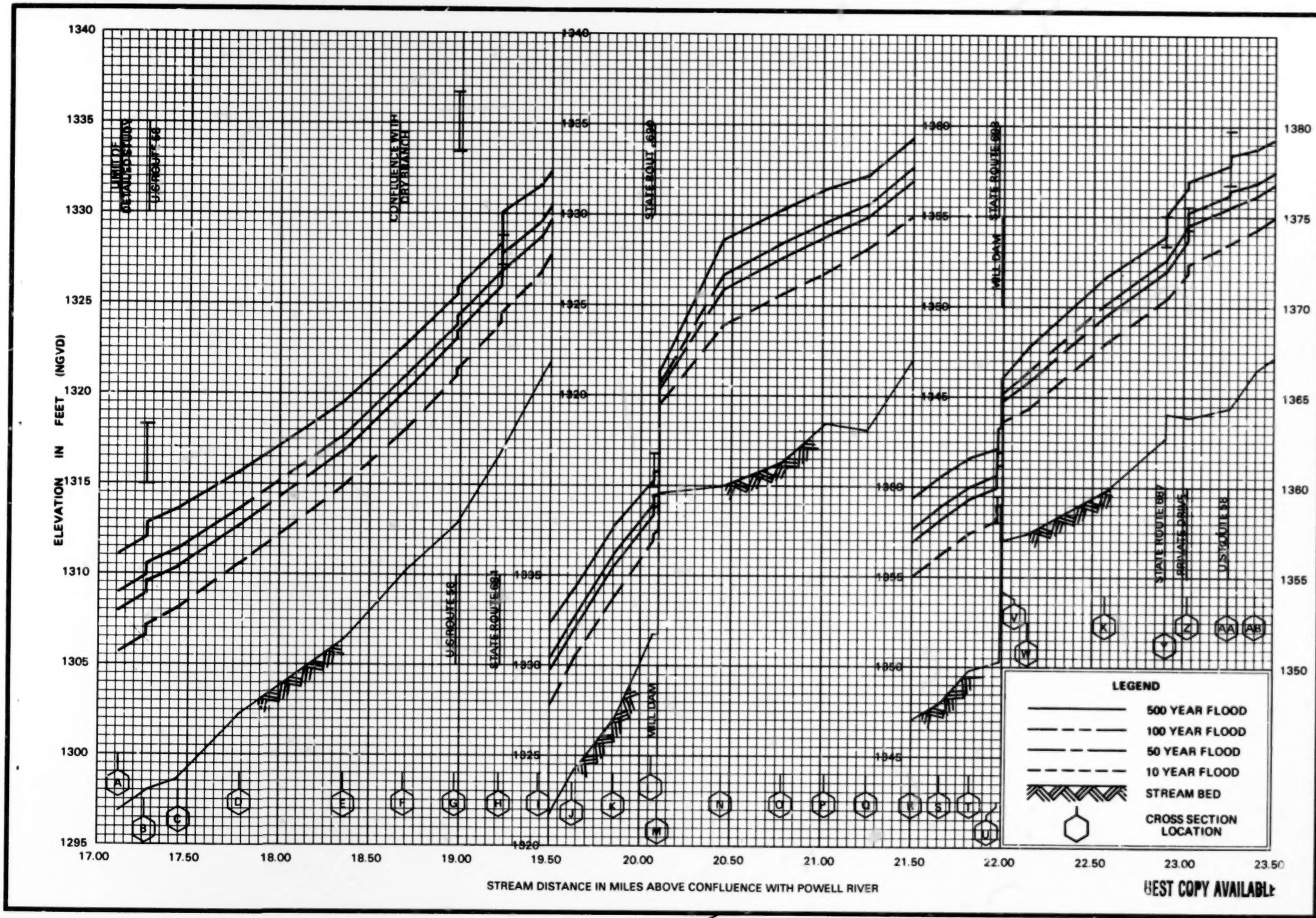
POOR VALLEY BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

24P

BEST COPY AVAILABLE



FLOOD PROFILES

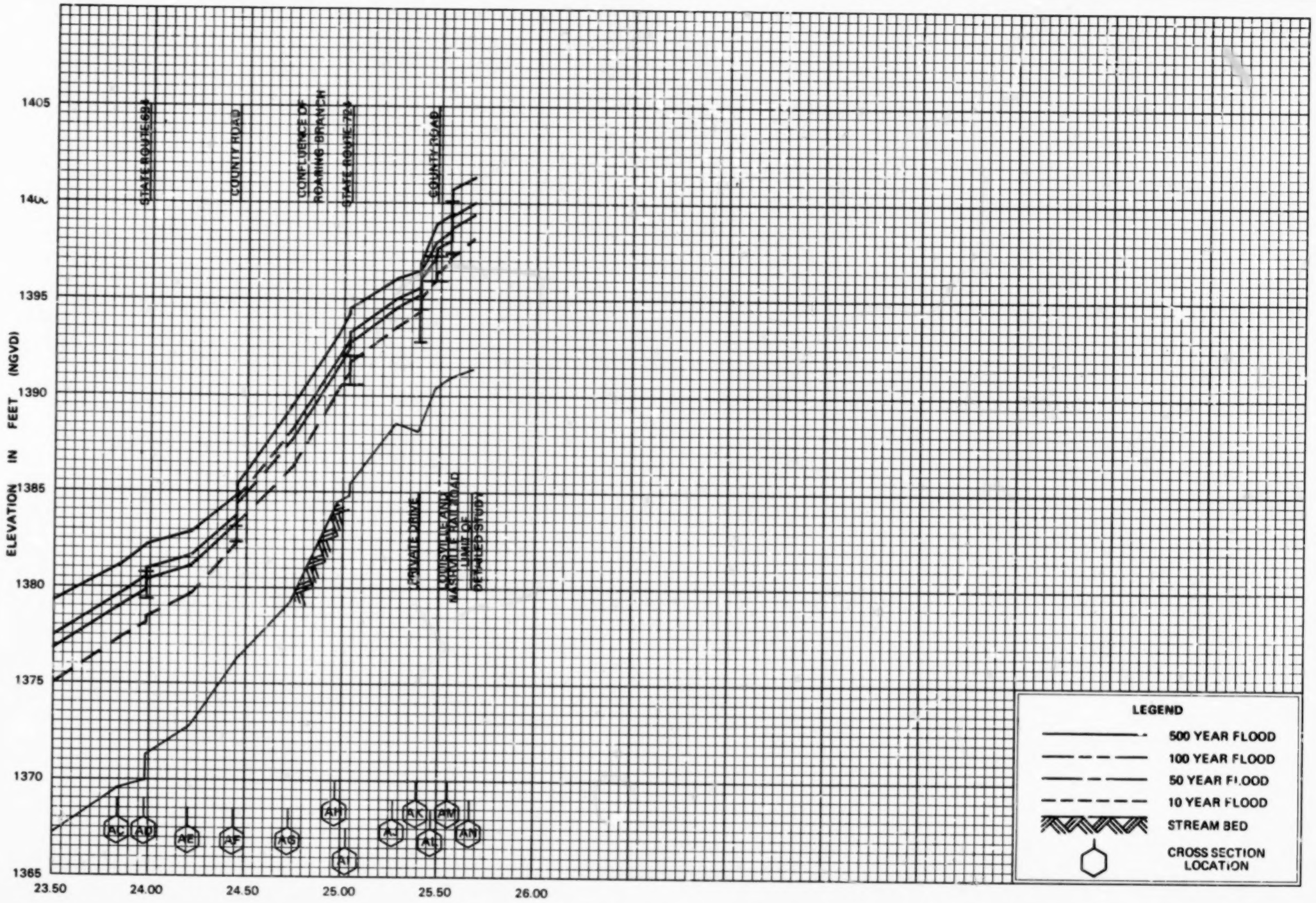
INDIAN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

25P

BEST COPY AVAILABLE



FLOOD PROFILES

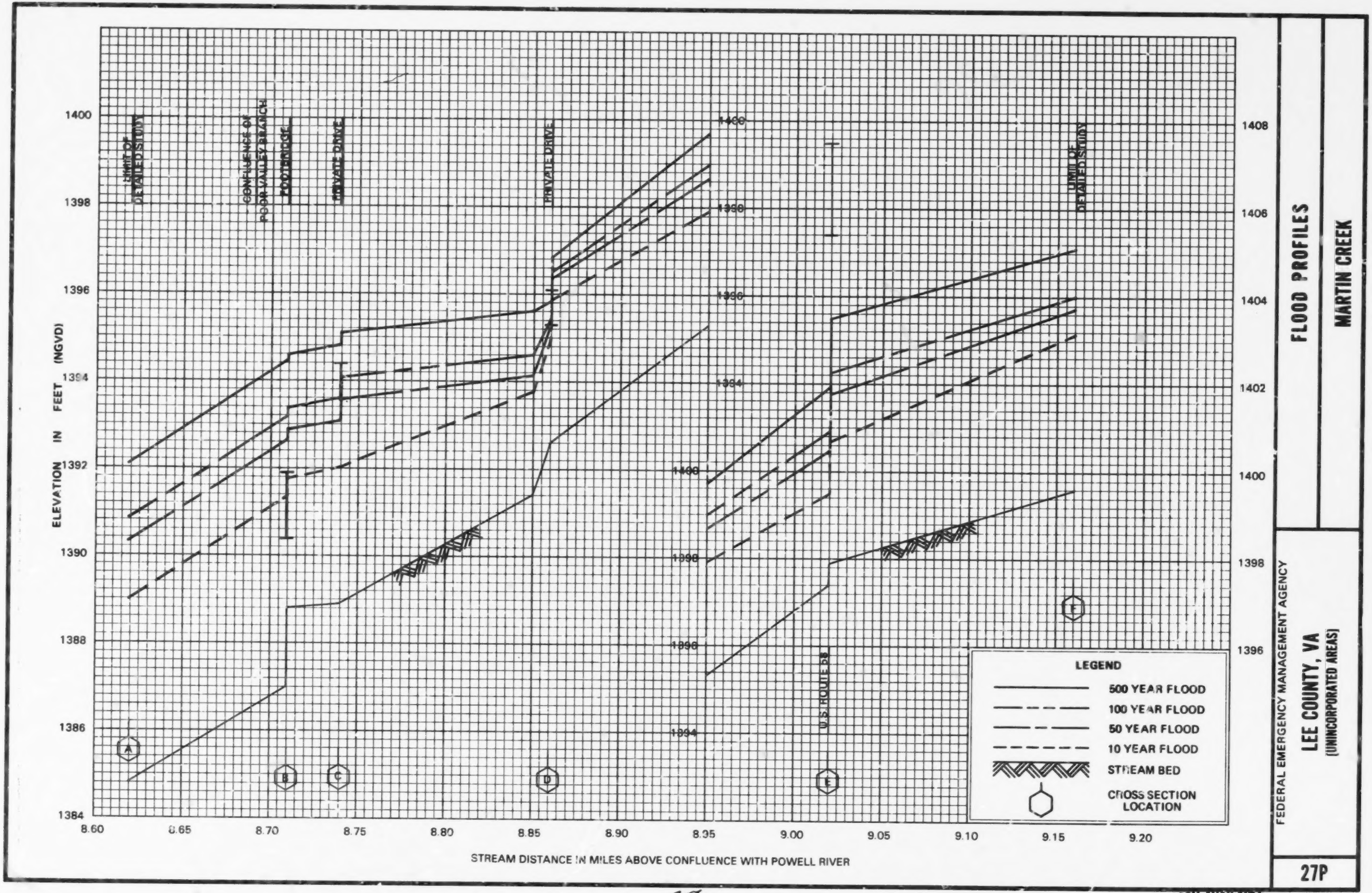
INDIAN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

26P

BEST COPY AVAILABLE



FLOOD PROFILES

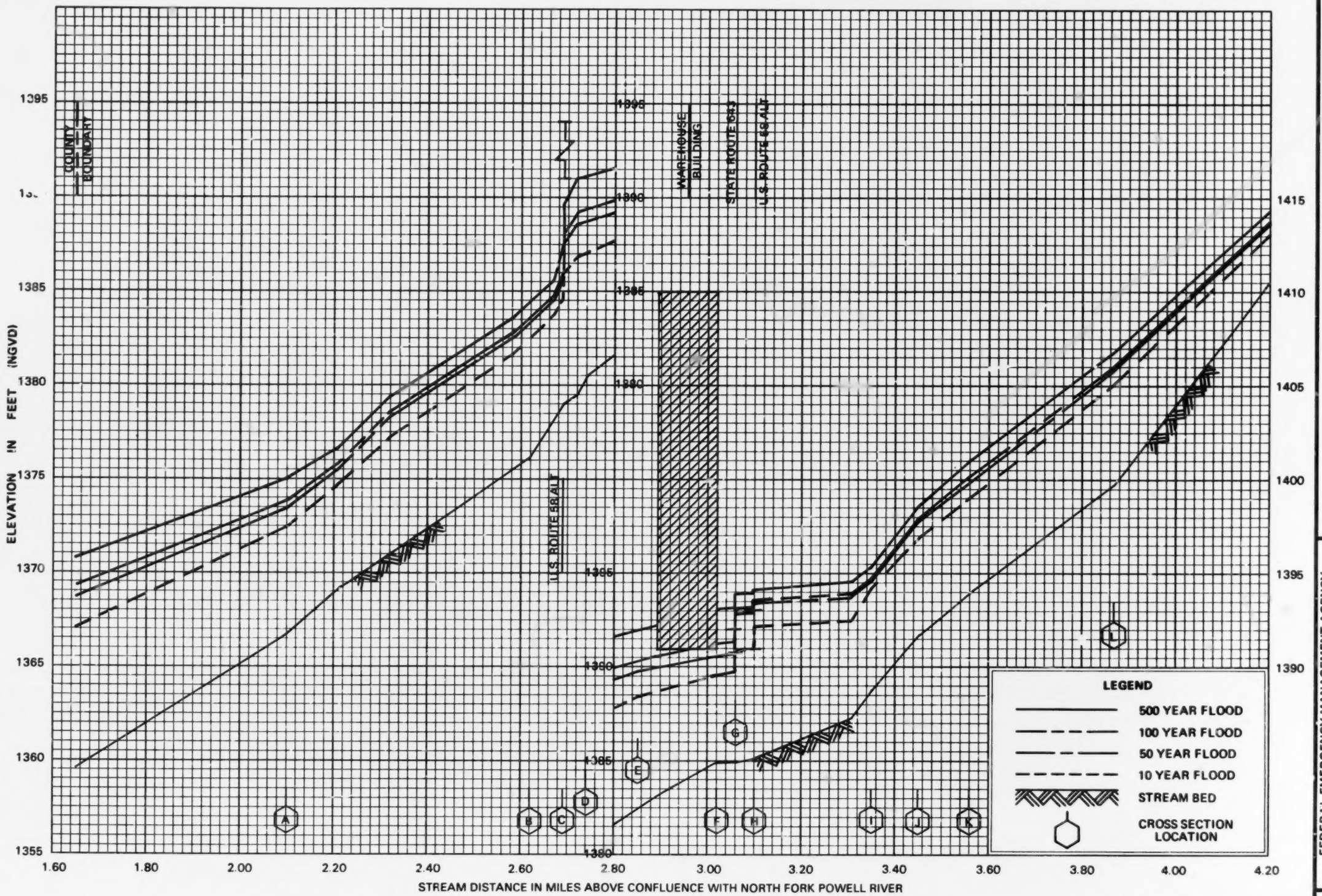
MARTIN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

27P

BEST COPY AVAILABLE



FLOOD PROFILES

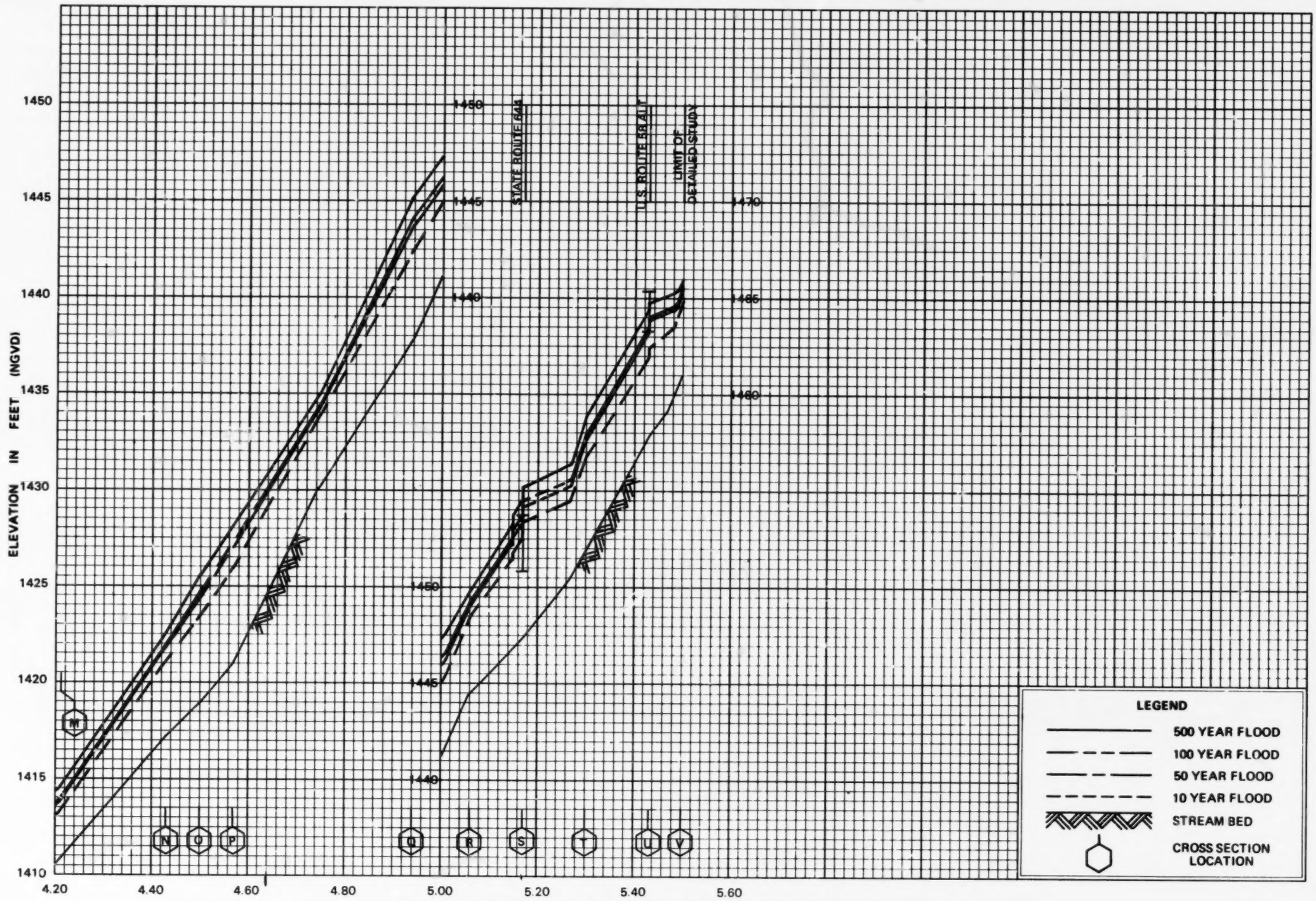
CANE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

25P

BEST COPY AVAILABLE



FLOOD PROFILES

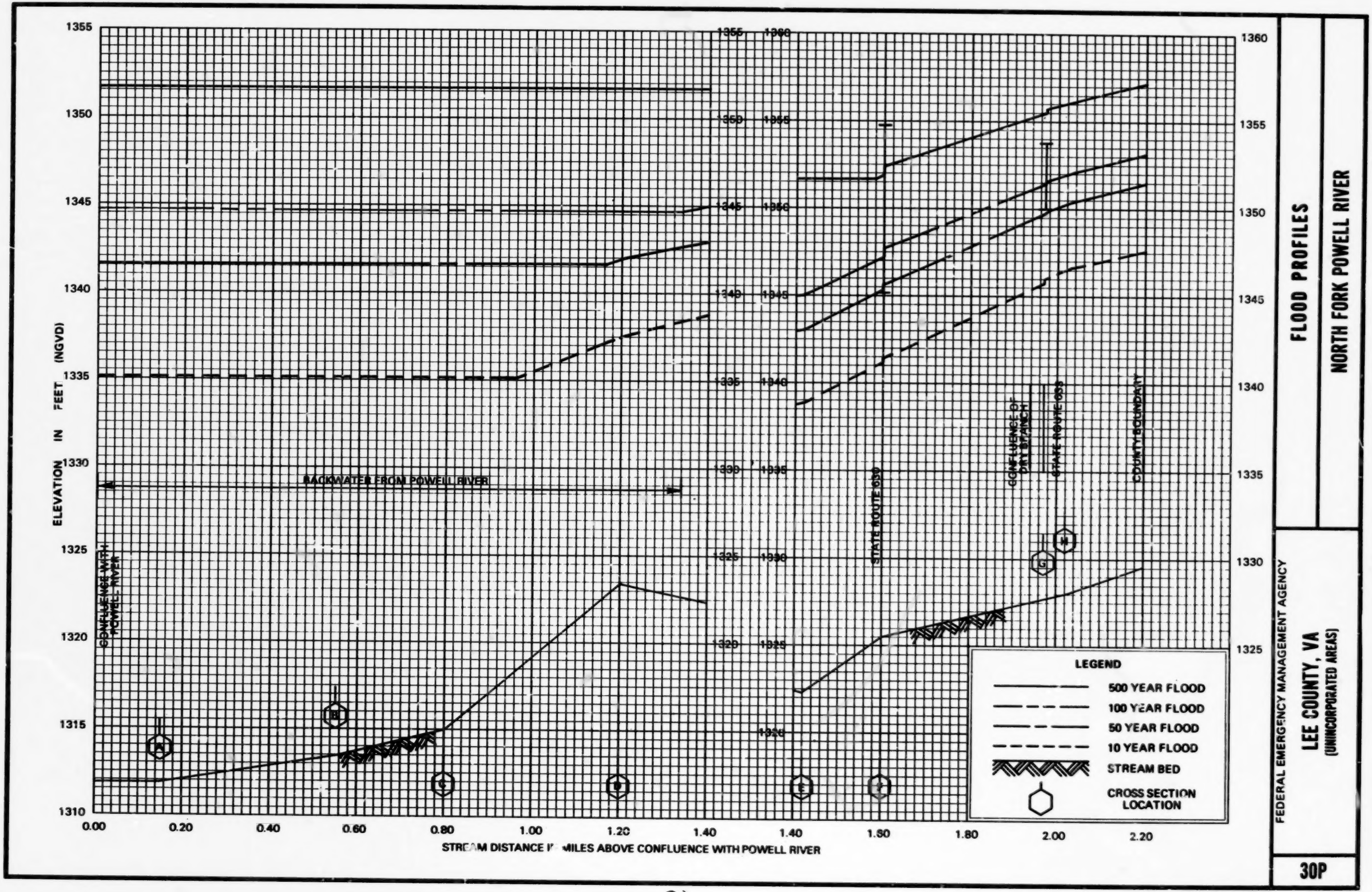
CANE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

29P

BEST COPY AVAILABLE



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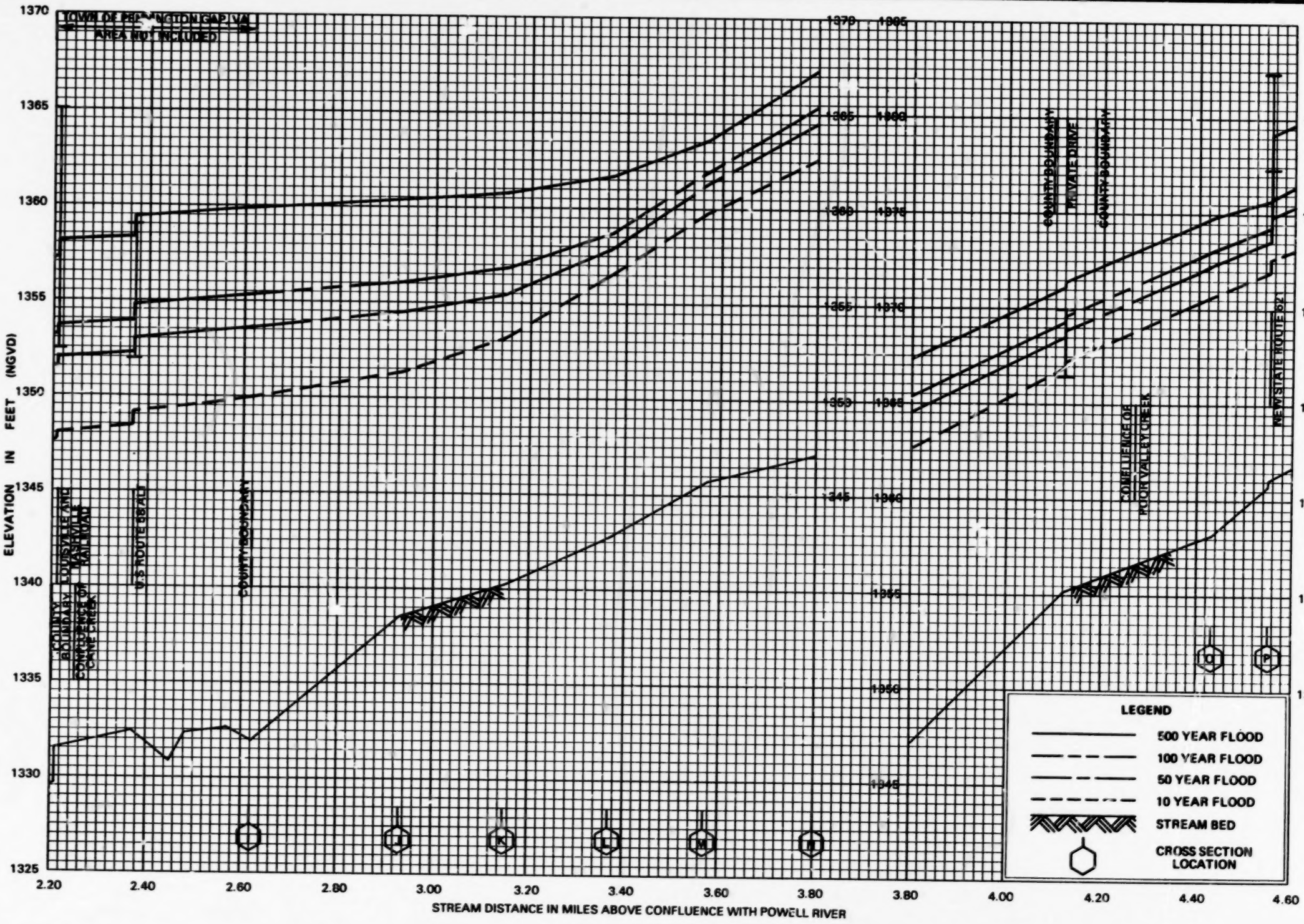


FLOOD PROFILES

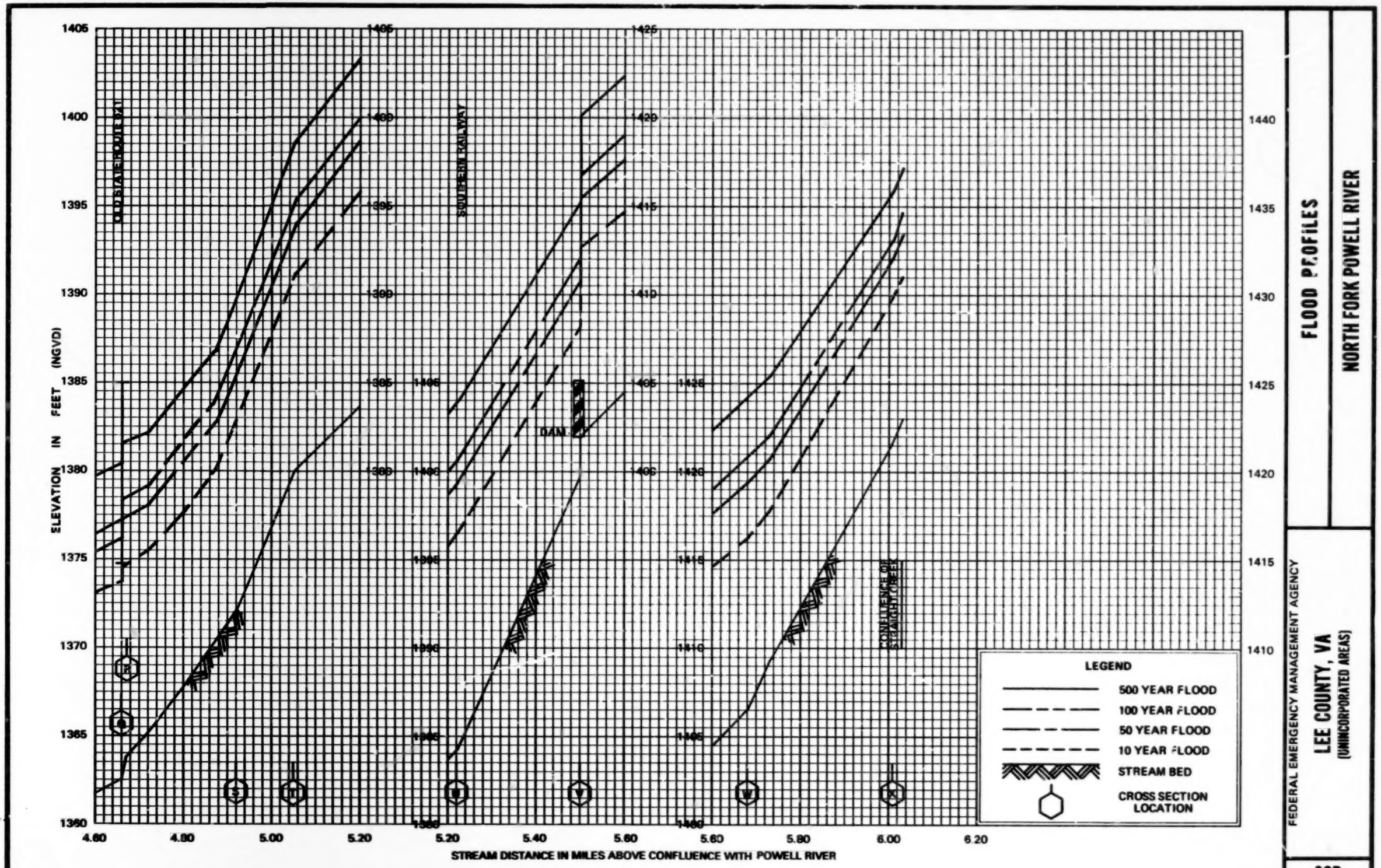
NORTH FORK POWELL RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

31P

BEST COPY AVAILABLE



FLOOD PROFILES

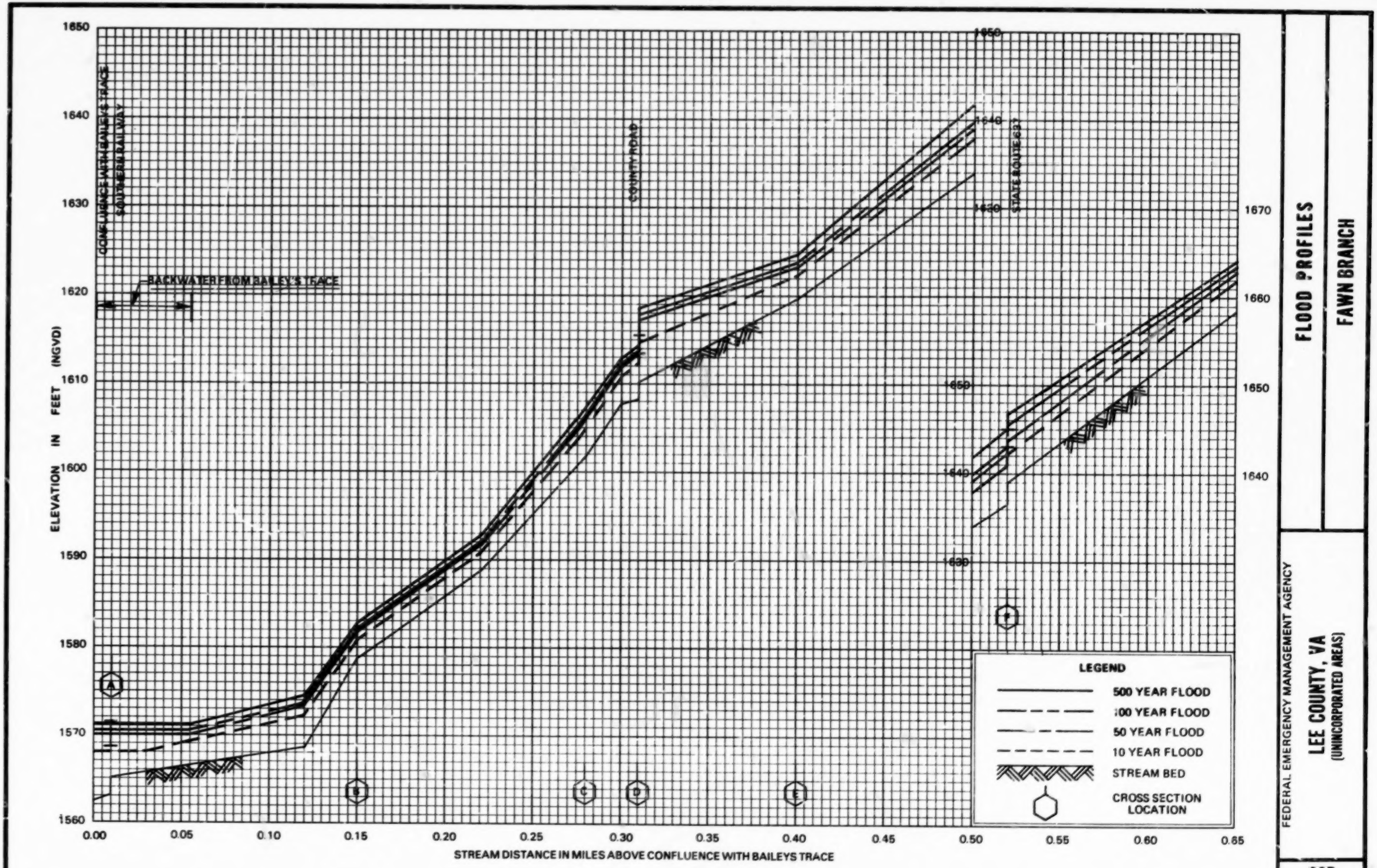
NORTH FORK POWELL RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

32P

BEST COPY AVAILABLE



FLOOD PROFILES

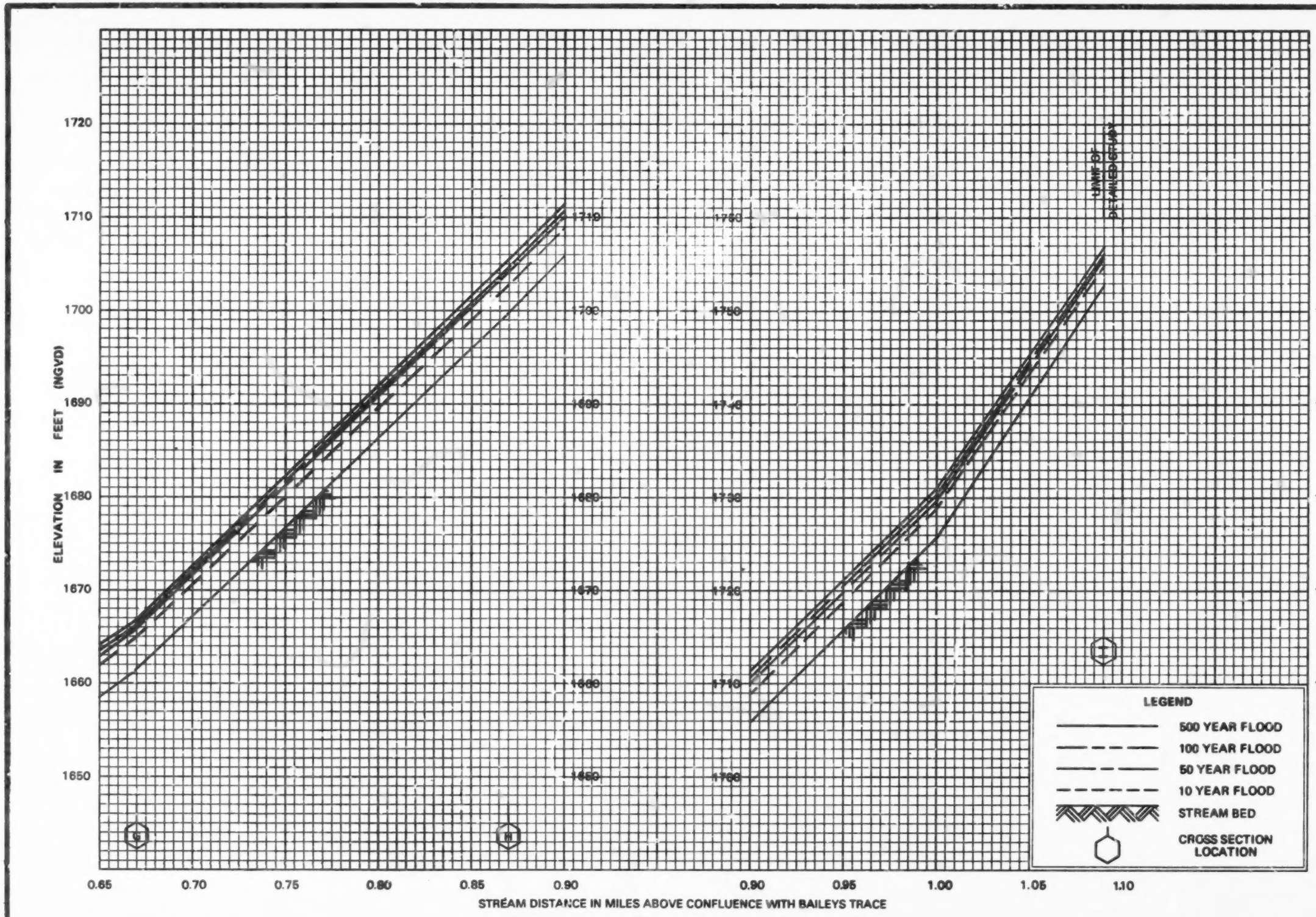
FAWN BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

33P

BEST COPY AVAILABLE



FLOOD PROFILES

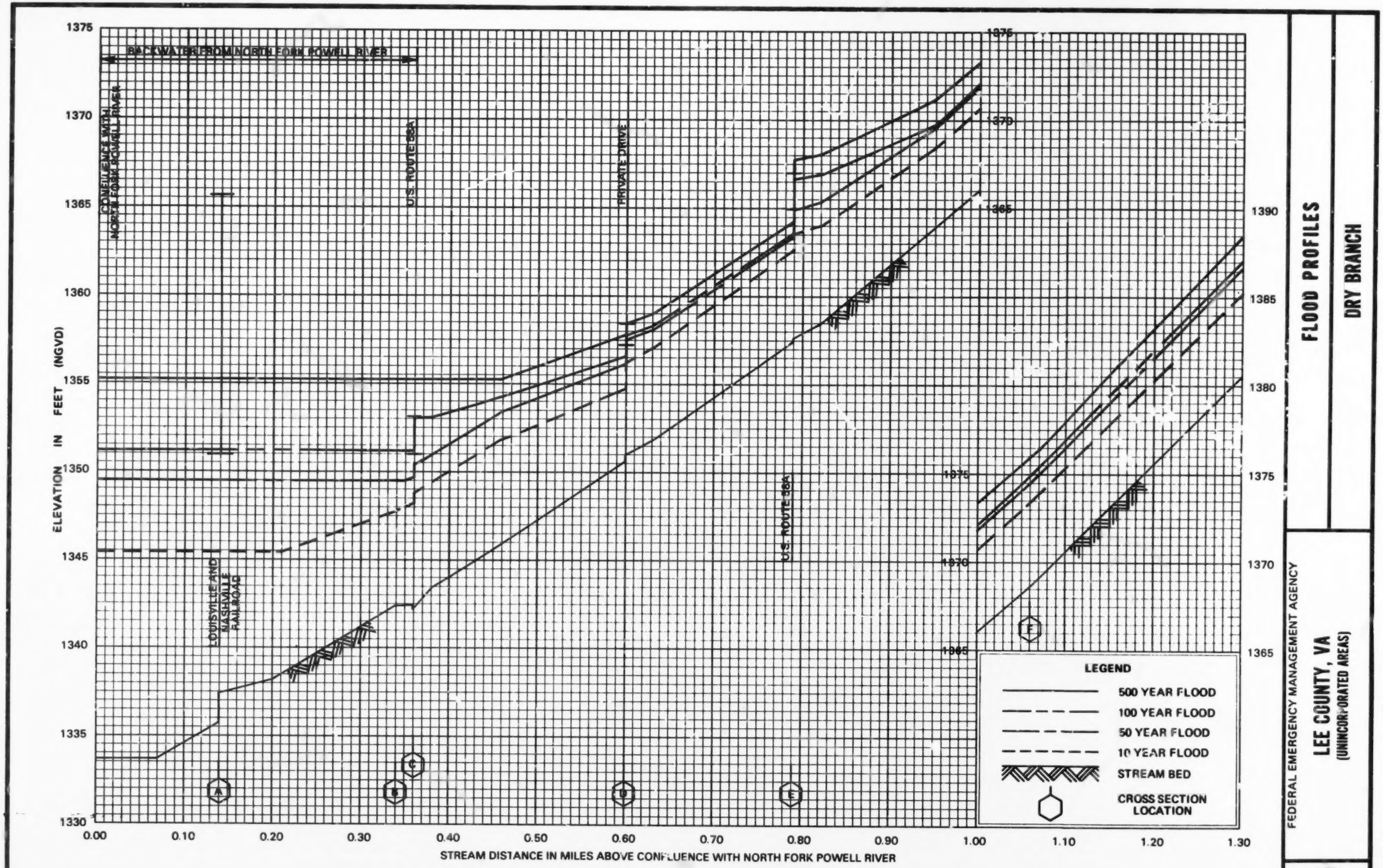
FAWN BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREA)

34P

BEST COPY AVAILABLE



FLOOD PROFILES

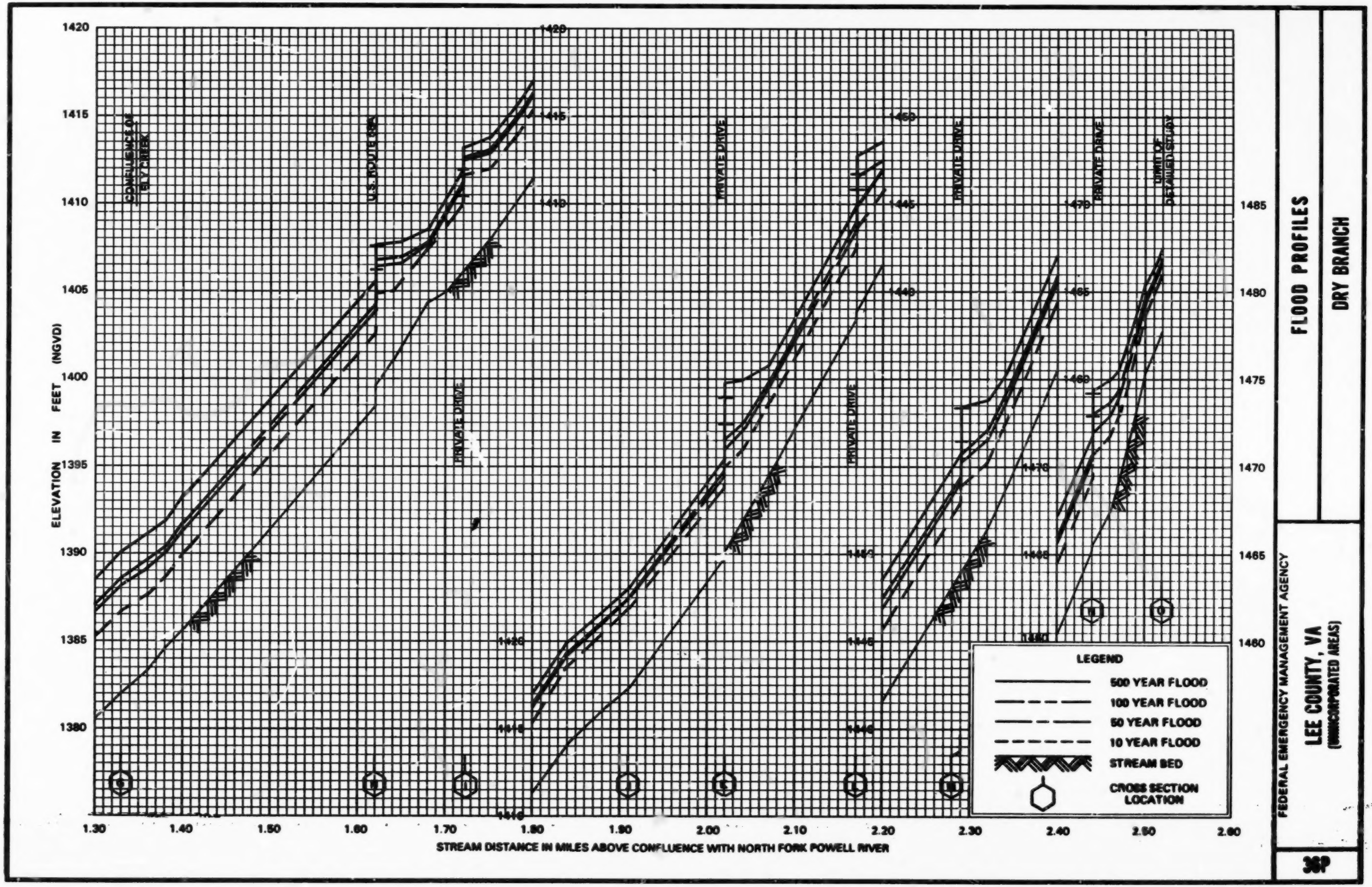
DRY BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

35P

BEST COPY AVAILABLE



FLOOD PROFILES

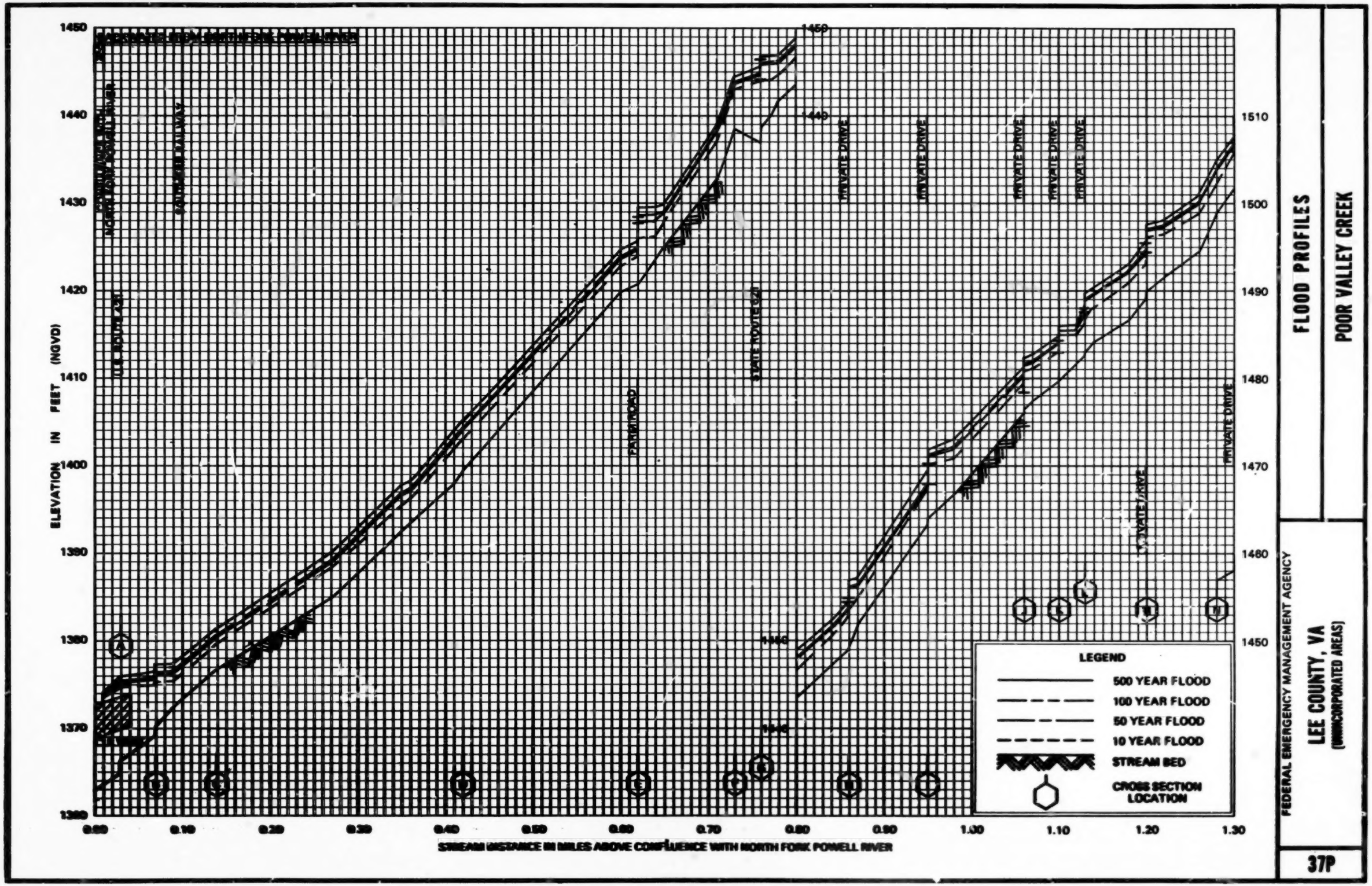
DRY BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

36P

BEST COPY AVAILABLE



FLOOD PROFILES

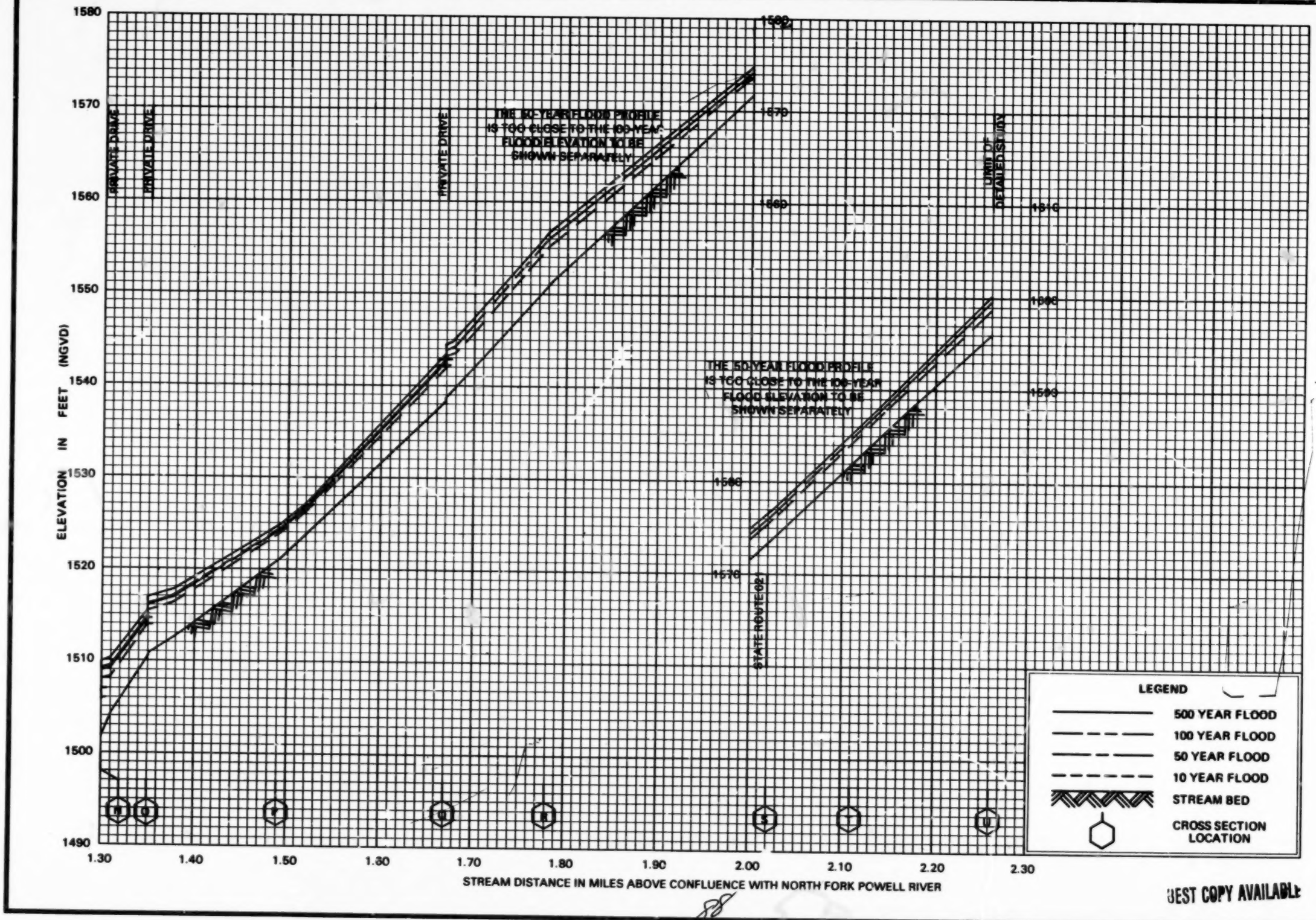
POOR VALLEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

37P

BEST COPY AVAILABLE



FLOOD PROFILES

POOR VALLEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

LEE COUNTY, VA
(UNINCORPORATED AREAS)

38P

BEST COPY AVAILABLE